PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

NEWTREX®

✓ HIGHER MELTING POINT

✓ GREATER VISCOSITY

✓ BETTER BODY

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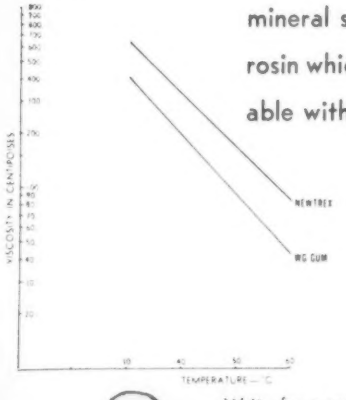
An outstanding development! NEWTREX is a pale, clean, high-melting, uniform wood rosin which is readily reactive with lime. NEWTREX gives a higher viscosity than is obtainable with any natural rosin, either wood or gum. Shown graphically is a comparison of equivalent 60% solids limed rosin (5% Ca(OH)₂) mineral spirits solutions made from NEWTREX, and gum rosin which illustrates the specific superior viscosity obtainable with NEWTREX.



TYPICAL ANALYSIS

COLOR	WG-WW
MELTING POINT (Cap)	68°C
MELTING POINT (B&R)	93°C
ACID VALUE	162
SAPONIFICATION VALUE	168

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MAY 1952

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3

FALK CCC PALE

a limed calcicoat type vehicle for greatest economy

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an unmodified drying oil with excellent non-penetrating qualities

FALKYD J-9

an alkyd designed specifically for highest quality flat paints

FALK'S Dependability and Economy

FALK & COMPANY

MINNEAPOLIS, MINN.

PAINT and VARNISH

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 42 MAY, 1952 NO. 5

NEXT ISSUE

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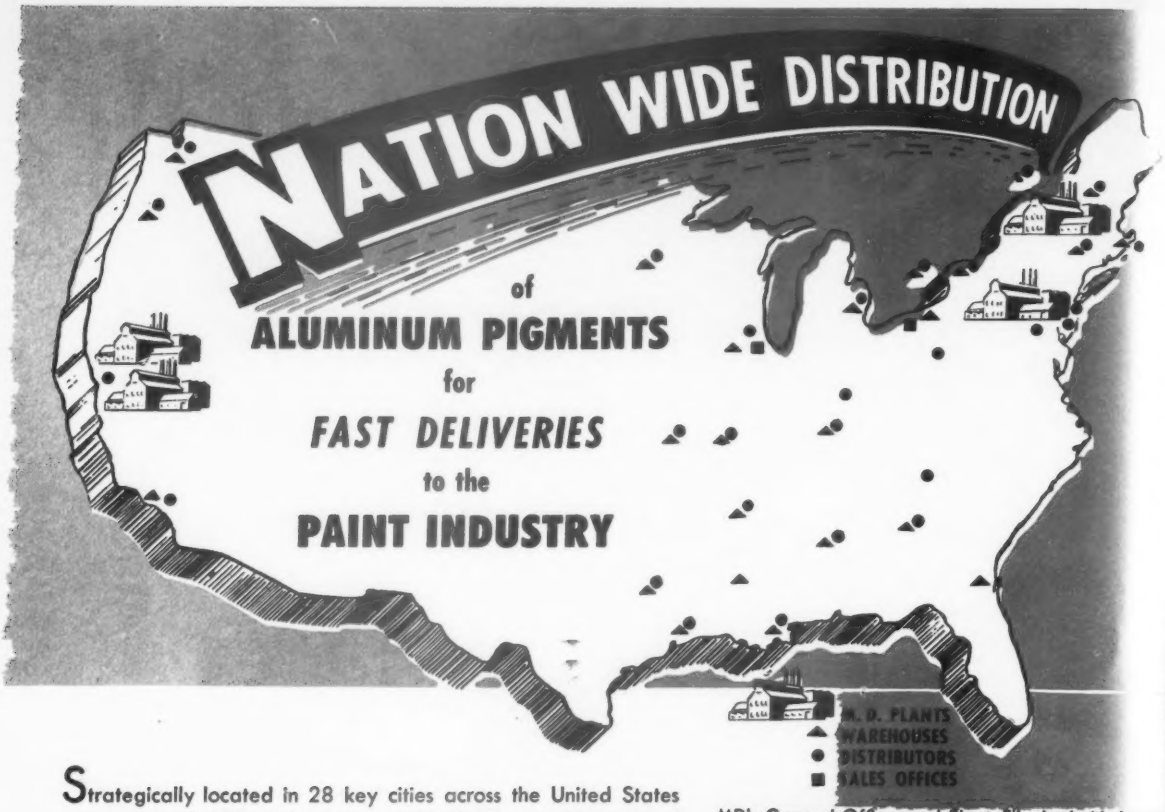

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American Know-How Needed

BELGIUM, faced with its biggest military paint job in history is getting some American production ideas on protective coatings for items ranging from steel helmets to mine sweepers.

In order to supply its own and North Atlantic Treaty forces with enough of the right kind of paint, the Belgian paint industry has sent six representatives to the United States on a two-month tour sponsored by the Mutual Security Agency under its productivity and technical assistance program.

The rearmament program currently is making huge demands on the Belgian paint industry which, up until now, has served a restricted home market. The industry has several million dollars worth of paint orders for the British and American armies in Germany. The Belgian paint industry has been asked to supply coatings for jerry cans (gasoline, water and oil containers), paint for steel helmets and sanitary equipment for hospitals, and enamel work for stoves and sinks in Army messes.

The problem of special types of paints and the manufacture of paints adaptable for application in "chain production" has risen from 5,000 Army trucks soon to hit the assembly line. Maritime coverings are requiring special paint. Belgium not only is carrying out important naval construction for her own forces, but has contracts with other countries for military production projects. In the connection, the Association of Belgian Paint and Varnish Manufacturers have been asked to prescribe minimum standards corresponding to those fixed by U. S. Navy for similar ships and for maintenance of Belgian merchant marine.

Paint protection for aircraft is virtually unknown in Belgium, although the country has built a powerful tactical air force with American and British assistance and now operates the largest air fleet serving Africa. Two Belgian paint producers already have established branches in the Congo, which is rich in strategic materials. These companies need the benefit of American experience in manufacturing protective coverings that will bear up in the tropics.

The low productivity of the Belgian paint industry has been an urgent military problem. To meet defense demands, the Belgian paint industry must bring itself up to date on plant lay-out, fabrication methods, use of manpower and material handling.

In this connection, the six Belgian representatives, currently on a U.S. tour are studying plant lay-out for ordinary plants and mass production, processes and machinery used in the manufacture of raw materials and protective finishes, latest coating application techniques, and methods used for maritime coverings and airplanes.

American "know-how" is again being sought by our friends abroad. We can be sure that our paint industry will cooperate wholeheartedly.

Pigment Expansion

EXPANSION goals for titanium dioxide and iron oxide, yellow (synthetic) were recently announced by the Defense Production Administration.

The goal for titanium dioxide calls for a production capacity of 370,000 short tons by January 1954, an expansion of 88,000 short tons over January 1951. For iron oxide, the goal for the domestic production is a capacity of 25,000 short tons by January 1955, an increase of 12,000 tons over January 1951.

However, DPA said that the establishment of goals for these chemicals do not constitute a commitment to furnished controlled materials as of any given quarter. The actual materials in each quarter will be conditioned by available supply and competing demands.

Both pigments are used extensively in the manufacture of civilian and military paints. Iron oxide provides the predominant olive drab color for military equipment. Because of its high infrared reflectance, this pigment is particularly useful in camouflage paints and other military finishes.

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hiladelphia	San Francisco
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Vancouver, Canada	

Did you recognize this picture as an aerial view of Philadelphia? Chances are, if your plant is in the Philadelphia area, you did.

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PLUS THESE IMPORTANT PRODUCTION ADVANTAGES . . .

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- ★ **Excellent body stability**
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EDGAR ASP 100 - EDGAR ASP 1100

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SPECIFICATIONS—AROCHEM 542

Melting Point (Mercury Method)	100-108° C.
Acid Value	20-30
Color (Gardner Stds. '33, 60% in Toluol)	10 Max.
Sp. Gr. (Approx. range @ 25° C.)	1.13-1.18
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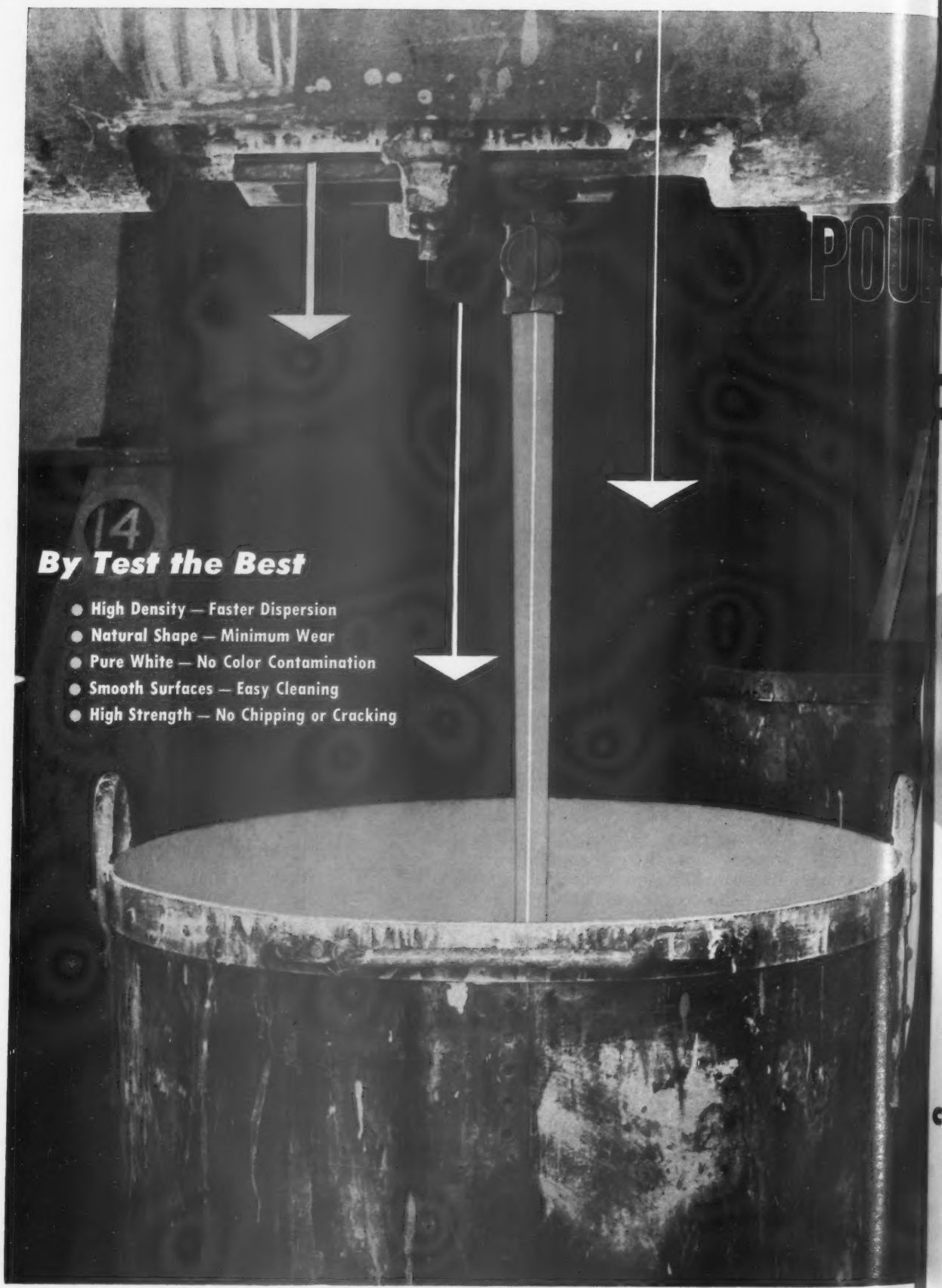
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Leading paint manufacturers have proved this. One large plant even reports a 50% cut in mill time on flat wall paint! Another plant got a No. 6 fineness—unobtainable in an overnight grind using conventional media.

COORS Alumina Ceramic Grinding Media is available as Balls (1" thru 3" dia.) or the new Natural Shape—developed specifically to speed pigment dispersion and minimize batch contamination in the paint industry.

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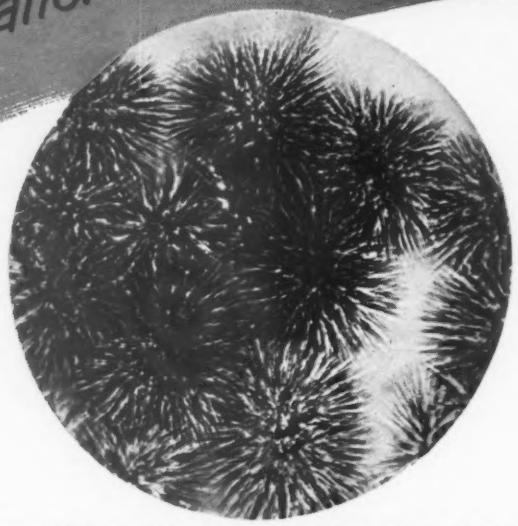

The secret of the superiority of "lead" paints lies largely in the typical and unique lead-soap crystals shown here. Notice interlacing of the spiney appendages. This adhesive, cohesive, felted mat structure is responsible for many of the superior mechanical and chemical properties that lengthen the life of "lead" paints.

The characteristics of white lead in paints are unequivocably and demonstrably true. For the reasons listed below, "lead" gives you numerous end-use advantages . . . such as controlled oil-penetration, improved drying and controlled chalking characteristics, greater mildew resistance, and protection against erosion . . . adding up to better appearance and longer *effective* service life.

"LEAD" LENGTHENS THE LIFE OF PAINT BECAUSE

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It Stabilizes—neutralizes acidic compounds resulting from the decomposition of the vehicle—prevents the film from becoming soft or liquefying.

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It Strengthens—flexible, spiney crystals in lead soaps mechanically reinforce the film and increase elastic strength.

It Resists Water—paint films with an optimum lead pigment content absorb only a small fraction as much water as they otherwise would.

It Limits Oil Penetration — more of the vehicle remains in the film where it is needed; less is absorbed in the substrata.

It Improves Appearance — by controlling chalking and inhibiting mildew.

The reasons for including white lead in the formulation of mixed pigment house paints make equally good sense to the paint chemist and to sales management. Simplified, they are understandable —and highly *saleable*—to anyone who makes, sells, or uses paints.

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420 Lexington Avenue,
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1066

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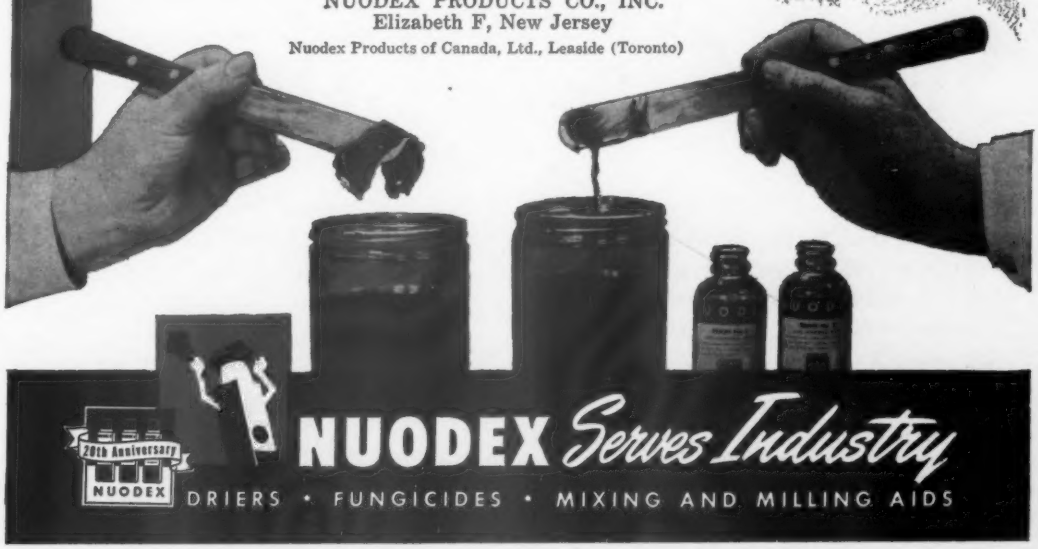

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Fatty Acid Esters for Polyvinyl Alcohol

By

A. E. RHEINECK

IT IS recognized that improved drying oils can be made by esterifying a given type of fatty acids with alcohols having more hydroxyl groups than glycerol. The use of the more highly functional alcohols in place of glycerol permits the use of acids more saturated than linseed acids. Approximately equivalent drying properties, as oils, can be obtained with a reconstituted linseed acid glycerol ester and a soybean acid pentaerythritol ester. Therefore, as the functionality (as measured by the ethylene linkages) of the fatty acids decreases, the functionality of the alcohol (as measured by the hydroxyl groups) must increase to obtain equivalent properties; a relationship exists between these functionality variables. With this concept in mind it should be theoretically possible to produce a drying oil from oleic acid and a highly polyfunctional alcohol.

The hexitols, mono-, di-, and poly-pentaerythritol, and polyallyl alcohols present no difficulties when esterified with fatty acids. When sugars are used as the polyhydric alcohols (6), esterification is accomplished by the reaction of acid chlorides in the presence of tertiary amines.

The degree of improvement possible with the pentaerythritol (2) and polyallyl alcohols (1, 3) is directly related to their hydroxyl content. Therefore similar fatty acid esters of polyvinyl alcohols would be expected to show greater improvements.

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Preparation

EIGHTEEN carbon unsaturated fatty acid esters of the polyvinyl alcohols can be prepared by the following methods:

a. preparation of monomeric vinyl esters, according to Rinse and Dorst (7), followed by polymerization; or,
b. replacement of *a* functional group in *a* polyvinyl compound with a fatty acid.

Polymerization of the monomer of the first method leads to a cross-linked polymer by reaction of the ethylene linkages of the fatty acid chain and the vinyl group. In the case of vinyl oleate a semi-liquid product with a limited degree of polymerization is possible.

The second method yields a polyvinyl ester of a definite structure in which unsaturation in the fatty acids remains available for oxidation and film formation. Eckey (4) used this method by application of the ester-ester interchange reaction. The work described in this paper applies this method by the direct

TABLE I

Effect of Fatty Acid Concentration on the Viscosity of the Refined Polyvinyl Alcohol Esters

PVA[4] Equivalents	Acids		Phenol Parts[1]	Crude Ester	Required Ester		Times Extracted
	Equivalents	Type		Acid Value	Acid Value	Ester Value[4]	
1	0.75	Linseed	450	Gelled[2]	....	....	....
1	1.00	Linseed	500	Solid[2,3]	....	....	....
1	1.25	Linseed	450	89	21.5	158.5	5
1	1.50	Linseed	450	98	20	161.0	5
1	1.50	Linseed	450	93	12	166	5
1	2.00	Linseed	450	107	11.5	162.5	5
1	2.00	Linseed	400	96.5	10	178	5
1	0.50	Neo-Fat 3R	400	Gelled	....	....	....
1	1.50	Neo-Fat 3R	450	100	4.7	168.3	5

[1] Parts per equivalent weight taken as 42.
[2] Too viscous to handle—probably a gel.
[3] Condition at end of esterification.
[4] Theoretical ester value is 184.
[5] du Pont's RH393.

esterification of 18 carbon unsaturated fatty acids and a polyvinyl alcohol.

Polyvinyl alcohol heated with fatty acids does not react but coagulates to form a product which is no longer soluble in its usual solvents. This suggested the use of a mutual solvent. Such a solvent would necessarily have to possess a high boiling point, 160°C. or higher, and be nonreactive with alcohols and acids. This limitation excludes the commonly used alcohols, esters, and hydrocarbons. Phenol, as used by Hilditch (5) to prepare mono- and di-glycerides, or a cresol was chosen as the mutual solvent; the former is preferred.

The polyvinyl alcohol chosen for this work was du Pont's RH393 (now known as 70-05), a low-viscosity type and 99% hydrolyzed. Other polyvinyl alcohols, e.g., RH-623, low-viscosity and 88% hydrolyzed, and RH428, medium viscosity and 92% hydrolyzed can also be used.

The RH393 polyvinyl alcohol is readily soluble in phenol (b.p. 182° C.) at 160°C. up to 20% concentration, forming a clear, dark amber, viscous solution. For convenience in this investigation a 10% to 12% solution was used. The polyvinyl alcohol-phenol solution will tolerate a quantity of fatty acids in excess of that necessary to esterify the alcohol provided they are added slowly over a period of 30 to 90 minutes with a simultaneous temperature rise to avoid turbidity. Under these conditions some reaction takes place, and the solution will boil between 185° to 188°C. with phenol and water distilling. The ester formed at this temperature undoubtedly acts as a solvent for both free acids and alcohol and compensates for phenol removed by distillation.

As the boiling point rises, the esterification rate increases, and the rate of phenol removal can be increased and adjusted to maintain a homogeneous solution. When the reaction pot temperature reaches 205° to 210°C., about one-half of the phenol is distilled. The remaining phenol can be removed rapidly up to 235°C. without causing turbidity, and esterification is continued with carbon dioxide sparge until the acid value remains constant.

Fatty acids are always used in excess of that required by the alcohol. This excess serves two functions

a. to drive the reaction to completion; and

b. to prevent gelation, which is a well-known effect in oil bodying reactions.

The product at this point is a crude ester; it has an acid value between 80 and 90, is somewhat viscous, and has a Gardner color (1933 standards) of about 7-8.

The crude ester is extracted with methanol at room temperature five times with an alcohol volume in each cycle equal to the volume of ester to be extracted. After five cycles approximately equal parts of raffinate and extract are obtained. The raffinate is the low-acid (15 or less) refined polyvinyl ester. Its yield, based upon the fatty acids, varies between 50% and 60%, depending upon esterification conditions. The extract has a high acid value and can be recycled in succeeding runs after removal of the methanol.

Since efforts were concentrated on making a product and studyign its properties, only a limited amount of work has been undertaken to determine the optimum methods of synthesis. However the preliminary runs indicated the following:

a. an excess of fatty acids, during the esterification, was necessary to prevent gelation, and

b. the quantity of phenol used as solvent influenced the viscosity of the final product.

These factors were investigated, using constant esterification conditions.

Viscosity Considerations

IN Table I the data showing the effect of fatty acid concentration on the viscosity (or gelation tendency) of the refined ester are indicated. Increasing amounts of free fatty acids have a stabilizing effect in preventing gelation. Judging from these data, if the molecular ratio of acid/alcohol is less than 1, the final product will be a gel; a ratio of 1 is borderline. The optimum ratio appears to be 1.25/1.

An attempt was made to reduce the quantity of phenol in order to simplify and reduce the cost of the process. The results of this work are indicated in Table II and are based on the results of Table I. The mole ratio of fatty acid to polyvinyl alcohol was held constant at 1.25/1. The phenol was varied from 200 to 450 parts by weight per one equivalent of alcohol. All the crude esters prior to extraction had

TABLE II

Effect of Phenol Concentration Upon the Viscosity of the Refined Polyvinyl Alcohol Esters

PVA Equivalents	Acids[1] Equivalents	Phenol Parts[2]	Acid Value		No. of Extractions	Remarks
			Before Extraction	After Extraction		
1	1.25	None	....	....	....	No reaction
1	1.25	200	....	35.6	2	Solid[3]
1	1.25	260	82	....	4	Gelled
1	1.25	300	80	....	4	Gelled
1	1.25	350	86	12	5	Gel particles
1	1.25	400	89	12	5	OK
1	1.25	450	89	21.5	5	OK

[1] Linseed acids.
[2] Parts per equivalent PVA.
[3] Probably a gel.

practically constant acid values. The viscosity of the refined ester was influenced by the number of methanol extraction steps used to recover it. The viscosity of the refined ester increased inversely as the amount of phenol used as the mutual solvent at the beginning of the reaction. The ester prepared with 350 parts of phenol showed gel particles after five extractions. Esters made with 300 and 260 parts of phenol (extracted four times) gelled after being thinned in xylene. Only two extractions were possible in the ester made with 200 parts of phenol; at this point the ester was almost solid. Practical results are obtain when 350 to 400 parts of phenol are used. The phenol used acts either as a depolymerizing agent on the polyvinyl alcohol or as a diluent which prevents polymerization of the polyvinyl esters through the unsaturation in the fatty acid chains.

The exact molecular size of the esterified polyvinyl alcohol is unknown. However it is fair to presume that it is not as high as the original starting material, which had a mole weight of about 6,000 and with probably 130 hydroxyl groups.

Several semi-pilot plant lots were prepared for evaluation purposes. The constants of these esters are shown in Table III.

The refined esters have strong gelation tendencies. In some instances they gelled by standing overnight and always skinned. This was overcome by storing the esters preferably as a xylene solution with an anti-skinning agent and in an inert atmosphere.

Drier Study

A study to determine optimum drier and inhibitor concentrations was undertaken. The results indicate that lead drier is incompatible and manganese has little or no effect. Between 0.025% and 0.05% cobalt as metal, introduced as the naphthenate, is the optimum. Up to 0.04% guaiacol appears effective as an anti-skin agent. A refined linseed ester so treated will dry dust-free in 35 to 45 minutes and foil free in 5 to 6 hours. It will bake dry in 5 minutes at 100°C. The guaiacol has no appreciable effect on the final drying of the ester although it appears to slow the cotton-free time.

The dried film of the linseed ester shows good depth of finish and scuff resistance, fair water resistance, good grease resistance, but poor alkali resistance. Upon aging, the films become tougher but not brittle. Generally the properties seem to lie between those of an oleoresinous and lacquer finish.

Properties of Various Esters

SEVERAL polyvinyl alcohol esters were prepared from different types of fatty acids; an acid/alcohol ratio of 1.25 and 400 parts of phenol per equivalent of alcohol was used. These esters were evaluated as varnishes. The performance data compared with several standards are given in Table IV. This preliminary information indicates that the polyvinyl linseed esters as varnish films compare very favorably in chemical resistance, outside exposures in Florida for 43 weeks, and physical properties with such products as a 33-gallon tung oil-phenolic varnish and an alkyd resin corresponding to Bureau of Ships Specification 52R13.

When the esters were used as a varnish, they showed better holdout than lacquer sealers but did not develop early hardness to permit sanding.

Attempts were made to use the extracted polyvinyl esters as varnish oils. The only resins with which it was possible to combine these esters were ester gum or the rosin ester of pentaerythritol. The more complex resins, e.g., phenolics and maleated ester gums, were incompatible. An ester gum varnish can be made by merely heating the resin and ester to 225°C. and thin-

TABLE III

Summary of Constants of Polyvinyl Linseed Esters Using 400 Parts Phenol Per Equivalent of Alcohol Prepared in Semi-Pilot Plant Lots

Equivalent Acids[1]	Crude Ester		Constants						
			MeOH Soluble			Refined Ester			
	Acid Value	% OH	%	Av.	% OH	%	Acid Value	% OH	Viscosity[2]
1.40	69.5	1.95	45.5	136	2.90	54.5	3.0	.20	I
1.25	81.5	2.05	55.5	126	4.20	44.5	5.4	.20	B/C
1.50	92.0	2.15	64.5	128	3.65	35.5	3.5	.15	C

[1] Linseed acids—equivalent acid/equivalent PVA.
[2] 50% nonvolatile in xylene (Gardner-Holdt).

TABLE IV

Typical Evaluation Results of Various Polyvinyl Alcohol Esters as Compared With Standard Products

Type	1 PVA Linseed	2 PVA Soybean	3 PVA Dehydrated Castor Oil	4 PVA Linseed	5 Automotive Lacquer (5)	6 33-Gal. Phenolic Tung Varnish	7 30-Gal. Dehydrated Castor Oil Ester Gum Varnish	8 35-Gal. Linseed Pentalyn M Varnish	9 Alkyd 52R13 Specification
Drier	0.05% Co	.0.05% Co	0.05% Co	0.05% Co	.....	0.03% Co 0.2% Pb	0.07% Co. 0.5% Pb	0.07% Co 0.5% Pb 0.05% Ca	0.03% Co
Dry Time (hrs.: min.)									
Set to Touch	:15	1:00	:50	:25	.....	:45	2:30	2:30	2:30
Cotton-Free	:30	2:00	1:30	:50	.....	3:00	4:30	4:30	7 hrs.+
Foil Free	5:30	24 hrs.	Overnight	4:30	.....	Overnight	Overnight	Overnight	24:00
Hardness—Sward, %									
3 Hours	4	4	6	4	42	4	.....	.....	.....
24 Hours	9	4	7	11	46	12	8	8	5
1 Week	12	4	9	17	40	19	12	12	9
Alkali Resistance (1)									
Time in Hrs.: Min.									
White	:10	:05	:05	:03	.....	.....	:15	:10	:05
Blister	:15	:10	:20	:25	2.00	.....	:20	:20	:10
3 Hours	(3)	(3)	(3)	(3)	Good	Good	(6)	(6)	(6)
Flexibility—Kauri Red									
Pass, %	140	160	100	120	.....	120		60	100
Fail, %	160	180	120	140	.....	140	40	80	120
Flexibility (2)							60		
Conical Mandrel	Failed	Passed	Passed	Failed	Failed	Passed		Failed	Passed
Rating	Poor	Chalked	.....	Poor	Poor	.....	Failed	Brittle	.....
Remarks	Adhesion			Adhesion	Adhesion		Brittle		
Discoloration (rating)									
Baking (10)	4	3	3	2	1	6		5	2
Ultraviolet Exposure	4	1	2	5	7	3	3	8	6
Cold Water Resistance (24 hours)							9		
Remarks	Sl. Bl. (4)	Bad Bl.	Sl. Bl.	Bl.	Bl.	Sl. Bl.		Bl.	Sl. Bl.
Recovery Time	:20	:20	:30	:30	:20	:30	Bl.	:20	:20
Hot Water Resistance (1-hour boil)							:20		
Remarks									
Blush Recovery (hr.: min.)	:10	:05	.05	:05	:10	:05		:05	:05
Hardness	:20	:10	:10	:05	:20	:05	:05	:05	:03
Outdoor Exposure							:05		
43 Weeks (Florida)	Failed	.....	Failed	.....	(7)	.....	Failed (8)	Failed	.....
Failure	.....	.....	Pealed	.....	Checked	.....	Checked	Checked	.....
Dirt Collection	Yes	Yes	.....	Spotty	.....	Less than 4	.....	.....	More than 4
Color—Rating		1		2		3 (9)			2
Gloss		2		2		3			1
Remarks				OK		OK			OK

(1) 1% NaOH after 48 hours.
(2) After 100 hours. Exposure in Weather-Ometer.
(3) Badly wrinkled, not destroyed.
(4) Sl. = Slight, Bl. = Blush.
(5) Automotive lacquer nitrocellulose + castor oil alkyd.
(6) Destroyed.
(7) Failed in 16 weeks.
(8) Failed in 25 weeks.
(9) Yellowed.
(10) Baked 2 hours at 150°F.

ning immediately. Higher temperatures or longer heating time resulted in gels in each case.

The drying properties and film characteristics of this varnish were not so good as those obtained by using the ester alone. These varnishes did not show any outstanding improvement over a linseed oil varnish of similar length. Apparently the presence of the resin detracts from the oil properties.

In order to eliminate the methanol extraction step, several attempts were made to esterify the crude ester with pentaerythritol. No gelation difficulties were encountered. However the ester so prepared did not have any of the outstanding characteristics of the extracted product; rather it resembled the corresponding pentaerythritol esters in properties.

An oleic acid ester prepared by the method of this paper dried cotton-free in 1½ hours and foil-free in 24 hours with .05% cobalt drier. After two days the film showed good adhesion and through-dry. Further aging showed good toughness and hardness without embrittlement. This was compared with an ester made by the peroxide polymerization of vinyl oleate (8), from which unreacted monomer was removed. The polymerized vinyl oleate ester did not dry hard or tough but remained soft or "cheesy," and did not compare favorably with the product made by direct esterification of the polyvinyl alcohol. This observation apparently verifies the fact that in the polymerized vinyl oleate, the molecular size (degree of polymerization) was not as great as that obtainable by direct esterification.

From work on the preparation and evaluation of the polyvinyl fatty acid esters certain facts are concluded, thus:

a. a better method of synthesis is to be desired in order to increase the yield; and

b. the performance data indicate that the final product has ultimate properties which are equal to or better than standard oleoresinous varnishes and alkyd resins.

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Protective Coating Requirements By The Bureau of Yards and Docks

THE Bureau of Yards and Docks is the housekeeping agency of the Department of the Navy. It has charge of construction and maintenance of shore installations including Navy bases and aircraft stations as well as Marine bases. As a result, their primary interest concerns maintenance finishes.

The Bureau is presently engaged in rewriting and bringing up to date the recommended painting practices to be followed by the Bureau. Along these lines the Fourth Naval District recently issued a *Painting Guide and Color Schedule* recommending a procedure to be used in the district for future interior and exterior maintenance. Some of the data in this guide that may be of interest to the paint industry is as follows:

"It is recommended that the exterior of training center buildings be repainted at intervals not to exceed five years and not less than three years. The frequency of painting will vary, dependent on local climatic conditions, the proximity of mining operations, industrial areas and concentrated railroad operations. These conditions affect exterior metal surfaces by action of corrosive gases. All painted surfaces in such areas are affected by the incrustation of oils and grits which decrease the life of the painted surface from the standpoint of good housekeeping and appearance.

In localities subject to severe climatic and industrial conditions, it is recommended that exterior painting be accomplished in the late Spring when fuel burning is at its annual ebb. The frequency of interior painting will be dependent upon local dust and industrial smoke conditions, but in any case, it should not be less than three years."

Color Schedule for Interior Surfaces

Color numbers refer to Bureau of Yards and Docks color standards.

Offices, Classrooms, Corridors and Assembly Rooms

Ceiling, flat white, interior flat paint, TT-P-47

Walls, #1 light green, interior flat paint, TT-P-47

Dado, #2 medium green, interior semi-gloss enamel, TT-E-508 with undercoat

Trim, #2 medium green, interior semi-gloss enamel, TT-E-508 with undercoat

Wardroom and Lounges

Ceiling, flat white, interior flat paint, TT-P-47

Walls, #1 light green, interior flat paint, TT-P-47

Dado, none

Trim, #2 medium green, interior semi-gloss enamel, TT-E-508 with undercoat.

Galley, Sick Bay, Heads, Lockers, Storerooms and Shops

Ceiling, flat white, interior flat paint, TT-P-47

Walls, #1 light green, interior semi-gloss enamel, TT-E-508 with undercoat.

Dado and trim, #2 medium green, interior semi-gloss enamel, TT-E-508 with undercoat.

Gear Lockers

Ceiling, unpainted

Walls and trim, #19 light Navy gray interior semi-gloss enamel, TT-E-508 with undercoat.

Boiler Room

All painted surfaces white, interior semi-gloss enamel, TT-E-508 with undercoat.

General Notes

Wall board and plaster, not previously painted, to receive a prime coat of primer sealer, TT-P-56a prior to painting according to the above schedule.

Interior sash to match dado, except that in rooms without a dado, sash will match walls. Interior doors and trim to match dado unless otherwise noted.

Use one coat of flat paint, of the same color, as the undercoat for semi-gloss enamel. The hiding quality of the enamel is insufficient to cover existing colors and stains.

Exterior

Corrugated Metal Roofs and Vertical End Walls of Quonset Type Buildings.

One spot coat of maintenance primer Bureau of Ships Formula 116, or red lead TT-P-86a, Type I. Two coats of aluminum (with first coat tinted) of aluminum paste, Navy 52-A-1, Type A with mixing varnish Navy 52-V-15, Type I.

Cinder Blocks

Two coats of #11 Suntan cement water paint, TT-P-21, Type I Class B.

Woodwork and Trim

Body of #19 light Navy gray exterior semi-gloss, TT-P-40 Finish coat, exterior chrome green, TT-P-71b.

Metal Smoke Stack and Breeching

Two coats of aluminum (with first coat tinted) of heat resistant aluminum paint, Navy 52-P-19c.

Miscellaneous Ferrous Metal

One spot coat of maintenance primer or red lead prior to aluminum or gray body coat.

General Notes

Aluminum paste to be mixed with mixing varnish in the proportion of 1½ paste to 1 varnish by weight. The first coat of aluminum is to be tinted to insure complete coverage with the second coat which is not tinted.

Preparation of Surfaces

The proper preparation of surfaces for painting cannot be overemphasized. The life of maintenance painting depends to a great extent upon the preparation of the surface in such a manner as to furnish a good bonding surface free from foreign matter.

Before the application of paint to previously painted interior surfaces, all dust, powdered paint and loose or peeling paint shall be removed by brushing and areas coated with a film of grease or industrial spot shall be cleaned by washing with a detergent. Enamel and semi-gloss surfaces shall be rubbed with fine sandpaper before application of fresh paint. Cracks and nail holes shall be filled with putty prior to painting old surfaces or following the prime coat on newly painted surfaces.

In the preparation of exterior metal surfaces, it is imperative to remove all loose paint and foreign matter by wire brush or scraping to clean bare metal before application of a primer paint.

Miscellaneous

Shop tools and machinery which require painting shall be painted light Navy gray, color #19, semi-gloss enamel. Fire-extinguishers, hose cabinets, hose line valves and an area of the bulkhead behind each extinguisher and hose line shall be painted "fire engine red" in accordance with safety requirements.

Concrete decks should not be painted but may be finished with a concrete floor sealer and a slip proof wax in order to prevent surface dust.

All of the above materials are available by specification and color number from the Standard Stock Catalog except the red lead primer, chrome green, and heat resistant aluminum paints."

Painting of Steel Pilings

The Bureau of Yards and Docks has carried out a study of the relative merits of various coatings for the protection of steel pilings exposed to sea water. A Steel Piling Task Committee was established in the Paints and Related Protective Coatings Advisory Committee of the National Security Industrial Association to review and aid in this test program. This committee was disbanded on January 1, 1952.

For evaluation of clean procedures, it is proposed that non-penetrating types of coatings such as bituminous and synthetic resin vehicle primers be applied to structural steel plate that has been sand blasted on one side and cleaned by ordinary means on the other. For wash primers and penetrating type paints ordinary cleaning is considered sufficient. (Ordinary cleaning is defined as the removal of all dirt and grease, and of the loose scale and rust that can be removed readily by scraping or wire-brushing.)

The steel panels are to be approximately 18 feet long. They will be installed vertical in order to have several feet under water at low tide and above water at high tide. After the most effective coatings are determined, they will be applied to both steel piles and steel sheet piles. The piles will be driven in order to determine the extent of damage to the coatings that might result from handling and driving. These piles will be driven in sea water to obtain under water and above water exposure and will be inspected periodically to determine performance.

Coatings being considered in the program include:

Coal-tar primers and enamels conforming to and applied in accordance with specification no. 34YB.

Bituminous emulsion coating, MIL-C-15203

Coal-tar-pitch base paint, MIL-P-6883

Wash primer, MIL-P-15328; vinyl red lead primer BuShips formula 119, and vinyl anti-fouling paint, MIL-P-15931

Wash primer; vinyl zinc chromate primer MIL-P-15930; and vinyl anti-fouling paint.

Zinc chromate primer, JAN-P-735; black plastic boot-topping primer, BuShips formula 90, and anti-corrosive shipbottom paint, BuShips formula 14.

Zinc chromate primer and anticorrosive shipbottom paint without the boot-topping primer.

Red lead primer, TT-P-86 Type IV, and anti-corrosive shipbottom paint.

Red lead primer, and zinc dust paint BuShips formula 102.

Zinc coating in accordance with A. S. T. M. A123-47.

In addition various combination of the above are to be included with different number of coats of the paints applied. Some consideration is also being given to various proprietary coatings.

Personnel

Mr. R. J. Potbury is Chief of the Specification and Estimating Branch, Engineering and Technical Services Division, Bureau of Yards and Docks. J. R. Stewart, F. A. Bennett and F. B. Leitzsey among others are included in this activity.

Pulsation In Centrifugal Blowers

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WHEN a centrifugal blower is used in the capacity range for which it was designed, pulsation is seldom a problem. There are, however, certain applications of blowers — where it is necessary to keep the blower running during periods of very small demand. In the case of certain heating processes these "turn-down" or "weekend holding" periods may call for as little as 10 or 20 per cent of rated volume output of the blower. In such cases, surging can set up a pulsation which may disturb the process and cause overheating and consequent damage.

Such pulsation can be prevented — and corrected — if one understands the mechanics of pulsation and the characteristics of a centrifugal blower.

The pressure-vs-delivery curves shown in Figure 1 are typical of all centrifugal blowers, the upper curve being of a well-designed blower, and the lower curve of a "not-so-well" designed blower. Note that in both cases the pressure attains a maximum high point at some relatively low rate of air output, the curve rising at air delivery rates below this critical value and descending at rates above this critical value.

If the demand on a blower is decreased in volume from a normal operating point, A, to another normal operating point, B, above the maximum-pressure point, the pressure at the blower merely rises correspondingly, and pulsation does not occur. If, however, the load or volume requirement is decreased beyond the maximum-pressure point, E, to a very low point, such as C, the following sequence of circumstances may set up surging.

The blower delivery pressure first decreases from E to C *at the blower itself*. Thus for a moment, the pressure in the piping system connected to the blower is greater than the pressure at the blower itself. Thus the air in the line tends to reverse its direction and flow back into the blower (this can be extremely dangerous in handling gas to a burner or combustion chamber) until both pressures become equalized. When this is achieved the blower again resumes its normal function of pumping air into the system — until the restriction at the line outlet again reduces throughout and causes the sequence to repeat.

It is this repetition which con-

(*Turn to Page 61*)

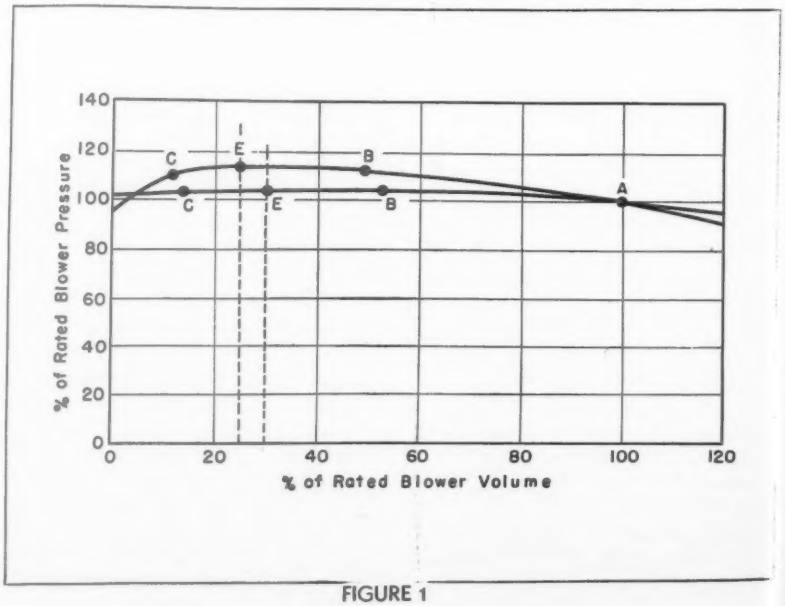

FIGURE 1

Synthetic Rubber Latex Paint

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DEVELOPMENTS in the domain of plastic materials during the past twenty-five years have had a great influence upon paint technology, but until recently the application of synthetic polymeric substances was limited to those of lower molecular weight (below 10,000), because only they were sufficiently soluble, a requirement for use in liquid paints. The most outstanding properties of plastics, in particular the combination of hardness, toughness, and flexibility, notably characterize the higher-molecular types, which, however, are insoluble or highly viscous in solution. For this reason their use in paints was excluded until a short time ago.

After the recent war two methods for using the higher polymers were developed in the U.S.A. One of these methods originated in Germany, where already during the war dispersions were made of polyvinyl chloride in a plasticizer that at room temperature did not dissolve the P.V.C. On heating, however, the two phases combined to a plasticized vinyl polymer having excellent flexibility and toughness, suitable for use in coatings for textiles and as a substitute for linoleum. The American products of this kind are called "plastisols", or if they contain also some volatile material they are called "organosols". This application has recently started, and seems to be very promising.

The other method is the use of emulsions or suspensions of high polymers in water. The particle size is much smaller than in the older emulsions, and because they do not swell in water (unlike the drying oils) the emulsions possess a low viscosity at a high solids content, up to 50 percent. They can be used as a vehicle for pigments to give, after drying, a continuous film.

Fine suspensions of this kind are known in Nature: for instance, rubber latex, a milky fluid that dries to an irreversible film. The many attempts to synthesize rubber have finally led to the development of several latices, of which the styrene-butadiene latex is now the most important. Natural rubber latex, and the corresponding synthetic rubber latices, give films that are too soft and too flexible for use as paint coatings; the cohesion of the film being so much larger than the adhesion to the surface to be protected, such coatings can be removed too easily. For a properly adherent paint film a harder polymer is required, and even during the war such products were developed, until now the paint manufacturer has a choice of a complete range of synthetic latices at a cost (on solids basis) comparable with the price of drying oils. Latex paints are particularly well suited for protecting and decorating walls, but other applications are possible because a latex coating can dry with a fair gloss. A recent innovation is that natural rubber with certain additions is being used for wall coatings by a process developed by the Rubber Foundation at Delft, in Holland.

While for rubber substitutes the ratio of styrene to butadiene is 25:75, and today even 20:80, the paint vehicle latices have a reversed ratio, i.e., a high styrene content. They are made by emulsifying the monomer or a mixture of monomers in water by means of a soap, usually an ammonium soap. The low viscosity of the monomers facilitates the very fine dispersion that is wanted. Then, by means of oxidation-reduction catalysts and promotors, the monomer in each droplet is polymerized, which happens at rather low temperatures (50°C., and sometimes even below 20°C.).

Latex of all types is used extensively in the rubber industry and for coating textiles, which are cured by means of vulcanizing agents at elevated temperatures. In the following pages only such types of latex will be discussed as can be used without curing, and accordingly are of interest to paint technologists. No attempt has been made to achieve completeness in listing commercial products. Several of the most important kinds are mentioned, and a survey is given of data from the literature, including available manufacturers' bulletins, avoiding contradictory

and less important statements.

Types of Latices

A. Styrene latex without butadiene or plasticizer dries to a hard resinous material. After evaporation of the water a very brittle and glossy product is obtained, which pulverizes very easily but after fusing will form a hard and tough coating. The styrene particles are too hard to join together to a coherent layer unless heated. If a plasticizer is dispersed in the latex a continuous film may be obtained on drying, because the droplets of plasticizer cement together the polystyrene particles. It may happen also that the plasticizer droplets already in the emulsion combine with the styrene particles to give a suspension of more or less sticky particles, and these adhere together when the water evaporates.

Because polystyrene is very stable, the double bonds having practically all been used in the polymerization reaction, the coating from a styrene latex is also very stable and will not discolor in sunlight, nor embrittle after suitable plasticization. All kinds of plasticizers can be used, e.g., dioctyl phthalate, sebacates, hydrogenated terphenyl (1), *o*-nitrodiphenyl, and butyl benzyl phthalate (2).

The quantity of plasticizer may be as high as 100 percent on the weight of polystyrene, but is usually not over 50 percent. A disadvantage of the addition of low-molecular-weight plasticizers is the chance that the plasticizer may migrate to the surface or be leached out by solvents.

The principal brands of polystyrene latex are:

"Bakelite BKS 90", and "92", "QKS 114", and "Lustrex X-601" and "X-620".

B. Styrene-butadiene latex. The styrene contents in the solids are at least 55 percent ("Chemigum 101 AX"), and mostly higher. Butadiene, with two double bonds in the molecule of which only one is used for the polymerization, gives rise to a certain degree of unsaturation in the polymer, as is indicated by the iodine value. As a consequence, the dried films will oxidize, harden, and turn slightly yellowish in sunlight. The drying of such latex films is more or less comparable to the drying of an unsaturated oil film. It is after evaporation of water a chemical reaction, while a polystyrene film dries only by evaporation. When properly directed by the addition of antioxidants to prevent serious embrittlement, such drying may be advantageous. The darkening of the film is observed only in whites, and is of no importance in colors. It seems that the levelling properties of the styrene-butadiene latices are slightly superior to those of the polystyrene latices. Moreover, because butadiene is chemically fixed in the polymer molecules and acts as an internal plasticizer, the opportunity for migration of plasticizer has been eliminated.

Some well-known commercial types are:

"Dow Latex 762 K", "Polyco 350 N", and "Chemigum 101 AX".

C. *Other latices.* Many other polymers can be prepared by the emulsion method, and are useful paint latices. Polyvinyl acetate latices will not be discussed here, because they have not found widespread application in the U.S.A. They are somewhat more sensitive to water than the styrene and styrene-butadiene latices, and their price is higher. In Europe, however, and especially in England, the polyvinyl acetate latices are better known. Their coatings possess very good exterior durability, excelling the other vinyl derivatives in that respect. In the U.S.A. much stress is laid on the washability of styrene latex coatings, which is certainly better than that of the coatings obtained from polyvinyl acetate latex, but for most applications such a high degree of washability is not required. The polyvinyl acetate latices are excellent adhesives.

Vinyl chloride latex yields coatings that are too hard, but a copolymer and vinylidene chloride has the right degree of softness. With these substances the polymers of the pure monomers are both hard, but the copolymer is much softer. It is a saturated product, and accordingly will not oxidize or discolor. It has better compatibility with oils and resins than the styrene and styrene-butadiene polymers. Expectations are that this copolymer latex will be usable for durable exterior paints ("Dow Latex 744B"). However, as with all chlorinated hydrocarbons, e.g., chlorinated rubber and P.V.C. itself, it will be necessary to add a stabilizer acting as a hydrogen-chloride-acceptor. The non-inflammability of the chlorinated products may be important for several interior applications.

Copolymers of acrylonitrile and vinylidene chloride possess outstanding resistance against chemicals, and because of their high surface tension they do not foam ("Saran Latex"). Butadiene-acrylonitrile latex ("Chemigum 200" series) gives unusual adhesion and grease resistance.

These other latices have not yet come to widespread application in the paint field, probably because of their high price.

Film Formation

DURING the drying of a latex film by evaporation of the continuous medium, i.e., the water phase, the rubber particles precipitate, the protective layer of emulsifying agent disappears by evaporation of ammonia, and the globules flow or stick together to form a smooth continuous layer. If pigments are present the latex must wet the pigment particles, unless the pigment has been ground beforehand in another vehicle. After drying, the pigment particles will be fixed firmly in the continuous layer of rubber. Because pigment particles are mostly within the range 1-20 microns it will be clear that the latex particles must be considerably smaller to form a good continuous coating. This is effectively the case, for they are only 0.1-0.2 microns in diameter.

The film should adhere well to the surface on which it is applied, and it should have sufficient cohesion to withstand mechanical influences, and especially scrubbing action. With several of the new latices all of these requirements can be met. Since the vehicle is high-molecular the penetration of the surface is negligibly small; this can be easily demonstrated by painting a piece of newsprint and watching the back of the sheet. Of course the use of plasticizers or drying oils will increase penetration.

Most latices are non-polar, and accordingly are not good wetting vehicles for pigments, being in this respect unlike oils. This fact has induced some paint formulators to

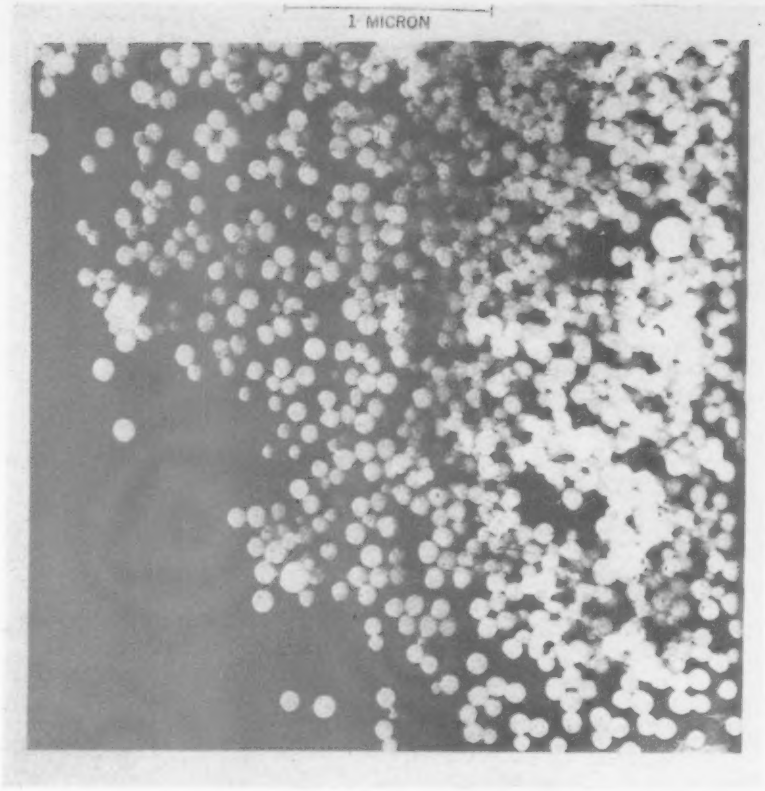
incorporate a small amount of oil in the paint, adequate for wetting the pigment particles. Then, during the drying process, the oil unites with the latex particles in the film. If the latex is very compatible with oil, the quantity of oil added may be larger. Plasticized styrene latex is well adapted to this use with oil, and the new P.V.C.-polyvinylidene chloride latex is even better. Such coatings will possess gloss because the vehicle components form a homogeneous layer. In some cases the addition of alkyds is recommended in the ratio of 1:1 with the polystyrene.

The drying process is irreversible, because the particles unite and also because the emulsifying agent decomposes by the evaporation of ammonia. Consequently a high resistance to water and alkali is obtained. When evaporation of the water is complete the film is set, and it will not change very much after that. Only when oxidizable polymers have been incorporated will an ageing effect proceed slowly, depending upon the conditions of exposure.

Properties of Latices

IN TABLE 1 the properties of the principal commercial products are listed. Values in the table are averages from manufacturers' data. The letters stand for:

A. "Bakelite BKS 90"
B. "Bakelite BKS 92"
C. "Bakelite QKS 114"
of Bakelite Division of Union Carbide & Carbon Corp., New York.
D. "Lustrex 601-2"
E. "Lustrex 620"
of Monsanto Chemical Co., St. Louis, Missouri.
F. "Dow Latex 762 K" of Dow Chemical Co., Midland, Michigan.
G. "Polyco 350 N" of American Polymer Co., Peabody, Mass.
H. "Chemigum 101 AX" of Goodyear Tire & Rubber Co., Akron, Ohio.
I. "Dow Latex 744-B" of Dow Chemical Co., Midland, Michigan.
J. "Chemigum 245" of Goodyear Tire & Rubber Co., Akron, Ohio.
K. "Saran Latex F.122" of Dow Chemical Co., Midland, Michigan.



Electron micrograph shows uniformity and particle size of polystyrene emulsions. Particles are about 0.1 micron in diameter.

It will be seen that all latices are alkaline except type K, which is neutral, and they have solids contents of 32-56 percent. The size of the negatively charged particles is extremely small (0·1-0·2 microns), considerably below that of common emulsions, which are in the range of 1-25 microns. The low viscosity of most of the latices must be attributed to the hydrophobic properties of the polymers, which do not swell in water as do the drying oils. The specific gravity of the dried polymers of the styrene and styrene-butadiene groups is close to 1.0; the chlorinated products are higher, up to 1.48.

The milky fluids possess considerable hiding power themselves, i.e., without any pigmentation. During drying this opacity disappears. Thus the wet hiding of a latex paint may be adequate, but the dried coating has insufficient hiding power. With the old type of emulsion paints the hiding power improved during drying, because the pigment particles became isolated and only partly fixed by the vehicle, consequently reflecting the light strongly.

The latex solids have a high molecular weight (e.g., 150,000), which makes them practically insoluble in solvents. They do not swell in water, and they are unsaponifiable; therefore, they will resist washing actions strongly. Their good physical properties, i.e., toughness and hardness, favor resistance to abrasion. Stains can be removed easily from the dry film.

On storage, latex paints may form a skin on top if the emulsifying agent decomposes. Such a skin cannot be re-emulsified, and should be removed. A small layer of anti-skinning agent, e.g., 0.1 percent of pine oil, will be helpful. If properly compounded no settling of pigment will occur. Here the addition of casein and other thickening agents is useful.

Pigmentation

ONLY INERT pigments and extenders can be used, because reactive pigments will disturb the stability of the emulsion. The principal shade for latex paints is white, and is made with the following materials:

Properties of Some Latices

Type	Ratio Monomers	% Solids	Viscosity in Poises at 25°C.	pH	Remarks
Styrene Latex A	—	32	1.5	9.5	—
" " B	—	39	35	9.3	Plasticized
" " C	—	38	45	9.3	Plasticized
" " D	—	50	0.3	10.3	—
" " E	—	40	0.1	8.5	Plasticized
Styrene-Butadiene Latex F	—	48	0.1	10	—
" " " G	60/40	45	0.2	9	—
" " " H	55/45	56	0.6	10.8	Viscous at 50%
Vinyl Chloride-Vinylidene Chloride Latex I	—	50	0.2	8.0	—
Butadiene-Acrylonitrile Latex J	67/33	43	0.2	11	—
Vinylidene Chloride-Acrylonitrile Latex K	—	51.5	0.5	7	Plasticized

TABLE I

Titanium White, for preference the rutile types
Lithopone
White Clays
Wet-ground Mica
Asbestine and Talc

The presence of soluble salts may be harmful, in particular the di- and trivalent metal ions such as those of calcium, magnesium, and aluminium. Calcium sulphate, being slightly water-soluble, will precipitate the polymer unless the latex is extra well stabilized or the pigment is ground in a protecting vehicle. For this purpose an alkyd is recommended, and then the use of calcium-sulphate-extended titanium pigments is possible.

For the preparation of colored latex paints only alkali-fast pigments are allowable (e.g., phthalocyanines, iron oxides chromium oxides, carbon black, cadmium yellows, toluidine red).

Addition of Other Vehicles

A PURE latex paint would have many deficiencies, such as rapid settling of pigments, and precipitation of rubber. To prevent this, other vehicles are used to improve the paint properties. The method of wetting the pigments by means of drying oils and alkyds has already been mentioned, and their use is in particular helpful if the polymer is more or less compatible with the oils. Plasticizers, too, are a part of the vehicle, and they may act as mutual solvent for oil and polymer. The combination of latex with oils has many advantages, and these are being recognized more and more. In order to maintain the characteristic properties of the rubber polymers, the ratio of oil to polymer should not exceed 1:1. The compounding of oil with latex requires a water-soluble thickening agent, and for this purpose casein and soya protein have proved to be superior to other products. Casein dissolves in alkaline solutions, preferably ammonia or an amine, which evaporate during drying so that the casein becomes insoluble again. Casein also promotes flowing properties in the film. The quantity of casein in the vehicle may be quite high, and amounts sometimes to 30 percent of the total vehicle solids. Consequently it will have a lasting influence on the properties of the coating.

The oils that can be used with these latices are unbodied oils, e.g., oiticica oil, and also bodied linseed oils, long-oil varnishes, and limed oils. Alkyds may also be used.

Thickening Agents

LATEX is usually of low viscosity, and therefore a thickening agent is required. Casein acts in this way, but often other products are used instead or in addition. Of these may be mentioned starch, methylcellulose, alginates, sodium carboxymethylcellulose, and sodium polyacrylate. In the absence of casein they are added to the pigment paste before the latex is added, otherwise after the paste has been made. Thickening agents prevent settling and improve brushability, but with the exception of casein they reduce flow properties.

Emulsifying Agents

BESIDES the emulsifying agent already present in the latex, some other type is often desirable to obtain a stable paint. Casein is very effective for this purpose, and other useful substances are soaps (e.g., of triethanolamine), rosin derivatives ("Dresinol") (3), and certain sorbitol derivatives ("Tweens" and "Spans") (4).

A new approach is the addition to the dry pigments of a styrene-maleic anhydride polymer ("Lustrex 820") (5), which is soluble in alkaline water. This polymer is a fine dry powder, which in admixture with the pigments will swell slightly when water is added, and finally dissolve when ammonia is added. It will enable dispersion of the pigments to be made easily, and grinding is not necessary.

Other Additives

WHEN foaming occurs during the mixing process, or during application, the addition of an anti-foaming agent is required. The latices of low surface tension will particularly need this. A mixture of tributyl phosphate with pine oil or with octanol (1:1) is efficient, and several commercial products of unknown composition such as "Defoamer ED" (6), "Balab Bubble Breaker" (7) and "Foamrex S3" (8) can be recommended.

To prevent mould attack on proteins a preservative is added, e.g., water-soluble phenol derivatives such as sodium pentachlorphenate (9) and sodium trichlorphenate (10).

Sometimes wetting agents are used to promote the dispersion of pigments. If drying proceeds too quickly the addition of water-soluble glycols is advisable; they also increase the freeze stability.

Calcium ions and other ions that would precipitate the latex can be removed by a suitable sequestering agent, e.g., tetrasodium phosphate or ethylene diamine tetra acetic acid. If these substances are present the harder kinds of water can be used.

If the smell is considered objectionable or a perfume is desired, some masking agent or ethereal oil can be added, e.g., cinnamon oil or pine oil.

(*Turn to Page 62*)

NEW PRODUCTS & IMPROVEMENTS

A MONTHLY MARKET SURVEY

RICH-ROTH

VISCOSIMETER
Ultrasonic Type

"Ultra-Viscoson" for continuous, automatic viscosity measurement utilizes ultrasonics. Hermetically sealed probe, the size of a fountain pen, has no moving parts, operates to 650°F, 10,000 atmospheres pressure, is installed permanently in pipe lines, production kettles or used in test tubes and beakers. Electronic computer, located up to 1 mile from probe, indicates viscosity of Newtonian materials from 0 - 50,000 centipoises x grams/cc. in 4 decades; — 0/50/500/5000/50000. Apparent viscosity of non-Newtonian materials measured over much greater range. Connection to recorder or controller provides continuous charts or automatic control. The Ultra-Viscoson is used for manufacturing and research in petroleum, resins, paper, plastics, starch, printing inks, coatings, and finishes. Rich-Roth Laboratories Blvd., E. Hartford 8, Conn.

MIXER
Adjustable Propellers

Whirpool Mixer equipped with a shaft 36 inches in length has two balanced 4 inch propellers which are adjustable to any position on the shaft. May be used for agitation of deep vessels and tanks. Heavy base combines a clamp that locks at many different positions. Standard Electric Mfg. Co., West Berlin, N. J.

STYRENE-ALKYD
Non-Castor

"Cycopol" S 201-1 is a petroleum spirits soluble non-castor styrene-alkyd copolymer resin recommended for use in fast drying trade sales and industrial finishes. According to the manufacturer, Cycopol S 210-1 is comparable to Cycopol S 101-1.

For increased drying speed in enamels to be applied by spraying it is suggested that the pigment dispersion be made with Cycopol S 210-1 and let down to the desired pigment volume with Cycopol S 102-5 or Cycopol S 202-5.

This resin is compatible with melamine resins in the ranges normally used and the addition of these thermosetting contributes to the solvent and chemical resistance of baked films. American Cyanamid Co., Coating Resins Dept., 30 Rockefeller Plaza, New York 20, N.Y.

STYRENE SERIES
Water-Soluble

Lustrex X-700 resins are finely divided, free flowing, off-white powders that dissolve readily in water to produce stable solutions covering a wide viscosity range. According to the manufacturer, the solutions of these resins are stable over a wide pH range and display no appreciable viscosity change from one to 12 pH.

These resins are stable colloids in water paints, natural and synthetic latices. Use of the resin does not reduce mechanical or pressure sensitivity; in many cases these properties are improved.

Suited for suspension polymerizations where subsequent removal of dispersing agents by washing is desired. They may also contribute to the dispersion of pigments and insoluble dyes in water. Finds application in textiles, sizing, finishing, film formers, and paper coatings. Monsanto Chemical Co., Plastics Div., Springfield, Mass.

BAKER-RAULANG

DRUM UP-ENDER
Can Be Rotated 90 Deg.

Economical hydraulic drum up-ender attachment which permits fork truck operators to pick up, transport, stack and empty heavy drums without leaving their seat, is available. Drums can be rotated 90 degrees for vertical or horizontal stacking, or tilted 45 degrees below horizontal for emptying at any height within the lift range of the truck.

The up-ender adds a rotating "fifth purpose" to the 4-purpose carriage which already provides standard forks, fork-spacer, an automatic adjusting clamp and side-shifter in one unit. De-mounting the unit is simple — remove two lock pins, unsnap one quick-detachable hydraulic hose coupling, and slide the up-ender off the forks. Baker-Raulang Co., Baker Industrial Truck Div., 1250 W. 80th St., Cleveland, Ohio.

HYDROCARBON DETECTOR
Portable Type

Low-cost instrument detects concentration of aromatic hydrocarbons. Features of instrument include separate graduations for ben-

zene, toluene, and xylene on the cylindrical scale; detector stain increases in direct relation to aromatic concentration; fast, simple operation; compactness of design, and ease of use. For more information concerning this detector, request MSA Bulletin No. DD-1 from Mine Safety Appliance Co., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa. PVP—March.

LABELER
May Be Adjusted

Labeler for various types of containers. Uses un-gummed or pre-gummed labels; with simple change-over, machine will also handle heat-activated labels. Can be operated on a straight line or almost any angle to the capping line. Adjusting mechanisms used in adapting machine to different size labels and containers are very simple. Known as the Label Master, this labeler employs the principle of spray application of adhesive to un-gummed labels and water to pre-gummed labels. Able Engineering, Inc., 607 22nd Ave., N.E. Minneapolis 18, Minn.

PROTECTING CREAM
Oil Repellent

Cream protects the skin from oils, solvents, thinners, and other water-insoluble liquids causing skin irritations. The cream is oil repellent and when applied to the skin causes the oil to form droplets and run off, preventing the oils, solvents, and the like from dissolving the skin's oils. Boyer-Cambell Co., 6540 St. Antoine, Detroit, Mich.

GLYPTAL ALKYD
Tolerates Petroleum Solvents

Low-cost, air dry, Glyptal alkyd paint resin which has high tolerance for petroleum solvents. Laboratory tests have shown that the new resin, designated as G-E 7315, can be reduced to 5 per cent solids with mineral spirits without the danger of throw-out.

Designed primarily for general-purpose primers and finishes, 7315 is suitable for farm equipment, truck and automotive primers and undercoats tractors and toys because of its high gasoline and oil resistance. Rapid finishing is also accomplished because of the new resin's "snap-dry".

Containing 49-51 per cent solids content by weight, 7315 is compatible with most of the other air-drying Glyptals. It also shows compatibility with chlorinated rubber, certain soya oils and vinyl resins. Chemical Div., General Electric Co., Pittsfield, Mass.

THINNER FORMULATION
Reduces Orange Peel

Formulations for lacquer thinners containing low boiling diluents and high boiling solvents have been effectively used by General Motors in improving automotive finishes. After studying various lacquers, GM found that when the diluent, which is used only to reduce viscosity, has a low boiling point all of it evaporates between the time the lacquer leaves the spray gun and the instant it touches the car body. On the other hand, when the solvent is high boiling the lacquer has a tendency to flow slightly and therefore reduces "orange peel" or rough finish.

The diluent GM uses is tetrolene with a distillation range of 60 to 90 deg. C. Solvents used are butyl-cellosolve and diacetone, both high boiling materials. About 75% of the thinner formulation boils below 95 deg. C. Of the higher fraction, 10% has a boiling range between 95 deg. and 135 deg., and 20% between 135 deg. and 175 deg.

COMPRESSORS
Portable-Type

Compressors, available for immediate delivery, are mounted on a trailer with a standard trailer hitch for towing behind a car or truck. The compressors also can be obtained with skid mountings where great mobility is not required or mounting in a truck body is desired.

The compressors are manufactured in three sizes to deliver 21, 35 or 50 cubic feet of air per minute. In designing the portable units, DeVilbiss engineers have used the V-type, 4-cylinder, 2-stage compressors to assure long periods of dependable, continuous operation. DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.

FISHER SCIENTIFIC

LABORATORY STIRRER
3-Way Type

Stirrer has very wide application in the laboratory, doing what formerly required at least three different stirrers. Its three shafts, two of which are geared to the third — or rotor — shaft, provide maximum speeds of 140, 825 and 5,000 r.p.m. respectively, and can be regulated to any intermediate r.p.m. from "off" to maximum by the rheostat.

"Stirring" has always been an important term in the laboratory. Sometimes it means the swift, shearing action that produces emulsions; again it's the gentle motion achieved with the simple glass stirring rod. Stirring may involve very light media like foam or other gas-liquid mixtures; or it may be necessary to stir heavy, viscous masses. For all these purposes the Versatile Stirrer has the matching characteristics, provided by the various shafts. Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.

LUCITE FILTER
For Lab Use

Laboratory-size multiple-disc filters are useful for filtration studies or can be used in production on a small scale. Lucite frames allow operator to watch the course of filtration runs. Available in a four-inch size with eleven square inches per sheet and also in an eight-inch size having 52 sq. inches per sheet. Ertel Engineering Co., Kingston 11, N.Y.

VINYL PLASTICIZER
Low Volatility

Primary vinyl plasticizer of low volatility designated Monoplex S-38 exhibits both good efficiency and satisfactory processing characteristics. It may be employed as the sole plasticizer, in blends with the Paraplex plasticizers, and in compounds containing low-cost secondary plasticizers and extenders.

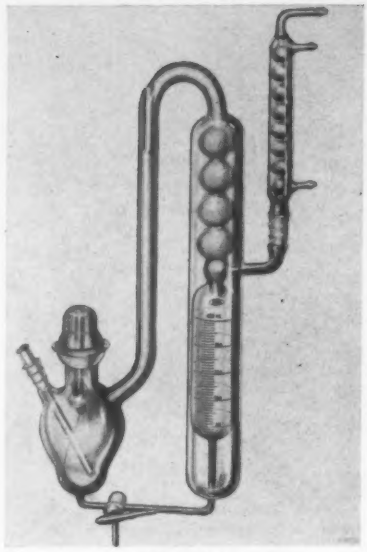
Because of its rather dark color, Monoplex S-38 is generally suitable for only filled and pigmented compounds. As a primary plasticizer for such materials, it offers considerable formulating economies without substantial sacrifice in quality. Monoplex S-38, therefore, is recommended for use in pocketbook stocks, gasket compounds, flooring, extruded molding, welding, and jacket stocks. Rohm & Haas Co., Washington Sq., Philadelphia, Pa.

RARE EARTH DRIER
For Epoxy Polymers

Soligen Rare Earth Naphthenate 4% is a catalyst primarily recommended for promoting cross-linking polymerization at elevated temperatures. Applications for this material are as drier catalyst in baked finishes which are based on pure epoxy resins or combinations of epoxy resins, urea-formaldehyde, melamine, or alkyd resins.

This drier aids greatly in increasing the molecular cross linking of heat reactive resins, resulting in increased hardness and toughness of the film, according to the manufacturer. It is most interesting in white baking enamels because of color retention as compared to cobalt drier, even when baked for 30 minutes at 350 deg. F. or 15 minutes at 300 deg. F.

With baking type soft oil alkyds (such as soya or dehydrated castor oil alkyds) as little as half the amount of rare earth metal can be used to replace the normal amount of cobalt metal in order to produce equal drying performance with improved toughness of film and with the absence of the usual discoloration at elevated temperatures. Samples of this drier and data are available upon request. Advance Solvents & Chemical Corp., 245 Fifth Ave., New York 16, N. Y.



GREINER

FLASH STILL
Obtains True Equilibrium

Still obtains equilibrium flash vaporization data for petroleum mixtures as easily as determining ordinary boiling point data, it is claimed. This is accomplished by the design of a modified recirculation type Othmer Still, used by numerous investigators with binary and ternary systems, and thoroughly evaluated at atmospheric and subatmospheric pressure for equilibrium conditions, entrainment and pressure drop.

The still always obtains true equilibrium, which is normally not the case in continuously operated pilot plant equipment. Emil Greiner Co., 22 N. Moore St., New York, N.Y.

CHROMATOGRAPHY UNIT
Simple Operation

Included in the apparatus is a stainless-steel support rack to hold the strips; a glass tray and Petri dish for the solvent; glass rods for attaching and holding the strips. The entire apparatus fits into a large cylindrical Pyrex brand glass jar with an outside diameter of 12 inches, an outside height of 24. This closure makes possible the saturated atmosphere required for optimum analyses.

The desired atmosphere of saturated solvent vapor is further maintained by a glass cover plate with a stoppered half-inch hole in the center for adding the solvent without lifting the entire top and disrupting the atmosphere's equilibrium.

This apparatus can be put to use immediately even by a worker unaccustomed to this method of analysis. He merely places one drop of each sample near the top of an individual paper strip and hangs the strips from the support rack (drops at the top). The upper edges of the strips are curled to dip into a 5½-by-4 inch trough, and solvent is added to this trough after the jar's atmosphere has become saturated with solvent from the lower dish.

When capillary action moves the solvent down the strip, components of the original drops separate vertically as individual streaks or bands. The determinations, of course, depend on the relative positions of the bands.

For constituents not naturally colored, identification is frequently accomplished by streaking the "chromatograms" with a staining material like potassium permanganate, ammonia or hydrogen sulfide or by fluorescence under ultraviolet radiation. Fisher Scientific Company, 717 Forbes Street, Pittsburgh 19, Pennsylvania.

NONYL PHENOL
Resin Intermediate

Nonyl phenol finds its widest use in the manufacture of wetting and emulsifying agents, and of oil additives. It is also suggested for use, however, as an intermediate in synthetic resins, fungicides, germicides, and rubber chemicals. Since nonyl phenol is a liquid at room temperatures, it offers handling advantages over solid alkyl phenols, which must be handled in dry or molten form. Rohm & Haas Co., Washington Sq., Philadelphia, Pa.

VINYL LATEX
Varied Uses

Pliovic Latex 300 is an aqueous dispersion of vinyl chloride copolymer. Properties include chemical inertness, grease-proofness, moisture resistance. Recommended for textiles, paper and binder for inks and paints. Chemical Div., Goodyear Tire & Rubber Co., Akron, Ohio.

The best in cans and service

CONTINENTAL GIVES YOU BOTH!

More and more paint manufacturers are learning that it pays to take advantage of Continental's double-barreled program for pleasing its customers.

You get the best in containers. Continental's "Tripletite" paint cans provide a 50% increase in guard points against oxidation and formation of wasteful, messy paint skin. In lid and lid seat, metal touches metal at three points instead of the usual two.

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Isn't it time *you* got acquainted with Continental containers AND Continental service? Just give us a call!

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NEWS DIGEST

G. P. Mack

G. P. Mack of Advance Solvents Talks on High Polymers at Newark

G. P. Mack, vice president in charge of research of Advance Solvents & Chemical Corp., gave a two hour lecture at the Newark College of Engineering on "High Polymers".

Mr. Mack went into detail on the various resins used in the Protective Coatings field, with particular emphasis on vinyl and silicone resins. After the lecture, an informal question and answer period was conducted, with fifty people present taking active participation.

•

G. L. Dennis Named Manager of Naugatuck West Coast Operation

Appointment of Gerald L. Dennis as branch manager of the West Coast operations of Naugatuck Chemical Division, United States Rubber Company.

Mr. Dennis, who was formerly technical sales representative for rubber latex and dispersions in the Philadelphia area, replaces J. Raymond Morath who died earlier this year. He will make his headquarters in the division's newly completed West Coast plant and branch office in Los Angeles, Calif.

•

A. K. Hamilton Heads CSC Product Divisions

Abbott K. Hamilton, a vice president of Commercial Solvents Corporation, has been placed in charge of Product Divisions, it has been announced by J. Hibert Woods, President. He succeeds H. J. Henry who recently resigned.

Mr. Hamilton has been with Commercial Solvents since 1946 when the corporation purchased Pennsylvania Alcohol and Chemical Corporation of which he was vice president.

Left to right: J. Young of Advance Solvents, F. Damitz, chairman of education committee of N.Y. Club, E. H. Shakespeare, chairman of technical training committee of N.Y.P.V.&L. Ass'n.

Brooklyn Tech. Class on Paint Production Graduates

Graduation ceremonies were held on April 1, 1952 at Brooklyn Technical High School for all those completing a course on paint production technique. This class was under the direction of Dr. David Krancer. The course was sponsored by the New York Paint, Varnish and Lacquer Association and the Board of Education.

The great speaker of the evening was Mr. Jesse S. Young, assistant to the president of Advance Solvents & Chemical Corporation, New York, New York. He delivered a talk on "Driers" and "Specialty Agents" for the protective coatings industry. After a half hour discussion, series of questions and answers were discussed.

Mr. E. Harold Shakespeare, Chairman of the Technical Training Committee of the New York Paint, Varnish & Lacquer Association, and Mr. Fred Damitz, Chairman of the Education Committee of the New York Paint & Varnish Production Club, addressed the class. Mr. Damitz also discussed the role of varnishes in the electrical insulation field.

Graduation Certificates were presented to the class personally by Mr. E. Harold Shakespeare.

1952 Expected to be a Glycerine Year for Alkyd Resin Makers

On the basis of current stocks and production trends, a glycerine supply situation which will permit effective advance planning without user concern as to "emergency" alternatives for glycerin is foreseen for 1952. This is especially important to producers of alkyd resins and ester gums.

From a technical standpoint, the use of glycerine in the manufacture of alkyd resins is said to be easily controlled to give a product of low acid number without undue hazard of gellation. Color retention and film toughness are high. The flexibility in formulations possible with various oil-modified glyceryl phthalates simplifies the task of meeting a wide range of specifications with the fewest variables and least experimental trial-and-error. The fact that glycerine is delivered as a liquid permits the advantage of simple volumetric measurement and easier handling in the plant with a wide operating tolerance that helps keep trouble at a minimum.

The 1951 production level of 211.3 million pounds, though some 7 per cent less than 1950's all-time high, proved adequate to meet both normal and special defense requirements, it was pointed out. Increased synthetic glycerine production during 1952 will also assist in maintaining a situation in which buyers can avoid "subject-to-change" specifications for their glycerine-containing products.

•

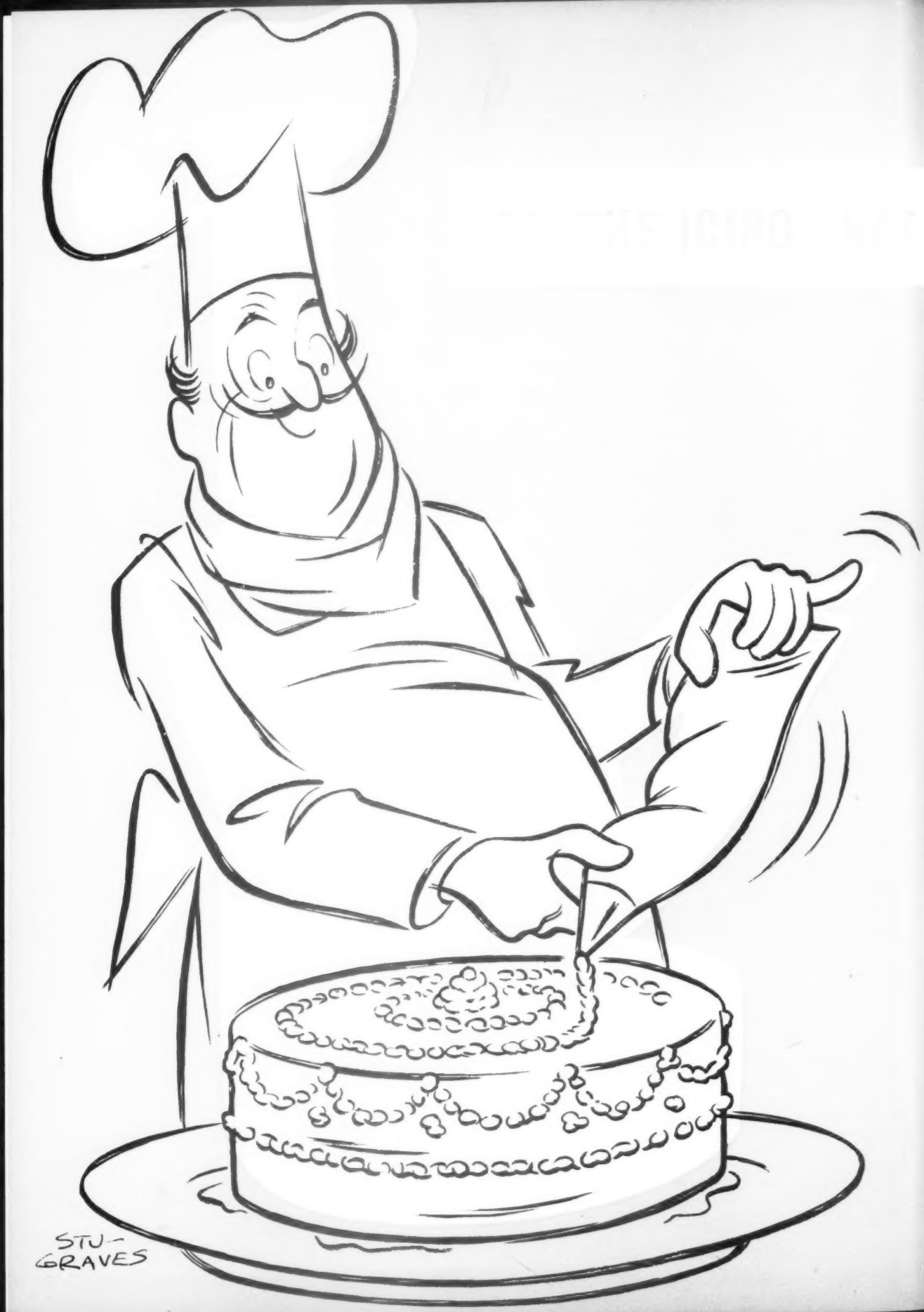
Radioisotopes Being Studied For Use in Can Manufacture

American Can Company's research division at Maywood, Ill., is continuing to broaden its research program by investigating the use of radioisotopes — atoms which emit radiation — in tracing complicated chemical and biological processes, the company reported.

O. F. Ecklund, technologist of Canco, is among 32 researchers who attended a four-week course in the techniques of using radioisotopes in research, given at Oak Ridge, Tenn. The course was conducted by the Special Training Division of the Oak Ridge Institute of Nuclear Studies, an educational organization comprising 29 southern universities.

In the company's creative research program, Mr. Ecklund plans to study the use of radioisotopes in food sterilization, for measuring the thickness of metal and organic coatings, and for curing rubber and enamel.

The radioisotope training program at Oak Ridge, which is now in its fourth year, is designed to teach researchers how to use this new scientific tool, which has been called the most important to be developed since the invention of the microscope, it was stated.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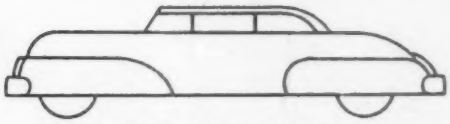
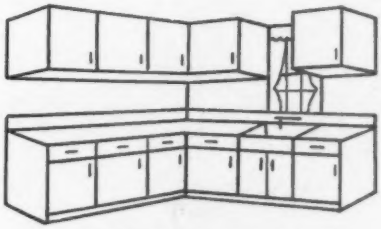


Durable finishes for automobiles.



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Dr. H. A. Hoppens

N. Y. Production Men Hear Talk on Silicone-Alkyds

The New York Paint and Varnish Production Club held its regular monthly meeting on April 3rd, 1952. A near capacity, 324 members and guests attended to hear Dr. Harold A. Hoppens of Plaskon discuss "Silicone Alkyds".

Fred Damitz, Chairman of the Educational Committee announced that a second presentation will be made of the Symposium on Copolymers in Surface Coatings. The first is scheduled for April 9th at Brooklyn Polytechnic Institute. A forum on "New Methods of applying Coatings" is scheduled for May 5th at the Newark College of Engineering on High Street in Newark, N.J.

A new feature of the Technical Committee meetings, according to Chairman Carl Engelhardt, are seminars on various subjects concerned with industry problems. The purpose is to try to develop suitable and worthwhile projects for future subcommittee work. The next Technical Committee meeting will feature the subject Flat Wall Paints with Fred Steig of the Titanium Pigment Corporation as moderator.

From the report of the Safety Committee, Dean Anderson Jr., Chairman, it is apparent that most accidents in the Paint Industry occur as a result of handling objects. Those reported usually being in the nature of strains and leg injuries.

Ernest S. Paterno, Chairman of the Membership Committee, announced the acceptance of the following new members and transfers. Class A — George H. Selesky and Howard O. Spreen both National Lead Co.; Thomas Accamando, The Monroe Sender Corp.; J. Howard Duff, Meadlo Duff Paint Corp.; Benjamin S. Locko, M. J. Merkin Paint Co. Inc.; William Lawrence, Art-Tex Adhesive Products, Inc.; John M. Kaheny, The Patterson-Sargent Co.; Kenneth W. Geldert, Miracle Paint and Chemical Co. Class B — Robert V. Cilla, J. S. & W. R. Eakins, Inc. Class A transfers — Sidney J. Rubin, Clover Leaf Paint Corp. and Frederick A. Voos, Jr., Miracle Paint and Chemical Co.

E. Dale Albert, Chairman of the Program Committee, requested an advance appropriation for the June Outing, a sure sign that summer is on the way. Dale then introduced the speaker of the evening Dr. Harold A. Hoppens. Dr. Hoppens is the Director of Technical Service for the Plaskon Division of the Libbey-Owens-Ford Glass Company in Toledo, Ohio. Dr. Hoppens is a native of Nebraska and a graduate of Creighton University in Omaha and of State University of Iowa where he received his Ph.D. in 1942. Since then he has specialized in research and development work on coating resins at Plaskon.

Dr. Hoppens pointed out in his paper "Silicone-Alkyds" that the heat resistant and weather resistant properties as inherent in silicone materials are highly desirable for incorporation in protective coating vehicles. However, the practical difficulties resulting from the low viscosity and long cure times of silicone resins, and the film properties of being thermoplastic, subject to solvent attack and poor in adhesion do not result in a practical vehicle. An alkyd vehicle has certain properties that are useful compromise for the silicone resin.

Effect of Pigment in Silicone-Alkyd on Weathering

Type of Titanium Dioxide	Florida Exposure Time to Reach Gloss of 30	
	Control Alkyd	Silicone-Alkyd
Anatase	1 month	4 months
Rutile	3 months	8 months
Rutile (Non-Chalking)	7 months	20 months

TABLE II

The method to obtain the best compromise of properties for a generally practical vehicle is chemical combination. The advantages of this definite procedure over mechanical mixing techniques is shown by the table 1.

By the chemical combination of silicone intermediates with various alkyds a wide variety of practical, easily formulated vehicles can be obtained. Two types, however, are of most importance, namely a heat resistant baking vehicle and an air drying vehicle.

Heat resistant materials can be prepared that very effectively retain their gloss, color and film integrity in the 300° to 500°F range. The films have excellent adhesion, and are not thermoplastic and have good solvent resistance. Weather resistance of baked films compared to melamine-alkyds have been evaluated over a two year period in Florida. A white enamel (Rutile titanium dioxide, non-chalking) dropped in gloss from 96 to only 70 while the control melamine-alkyd dropped from 90 to 24.

The most effective use of chemical combination is in preparing an air drying vehicle. Data indicates that a sufficient silicone content for effective resistance to weathering cannot be obtained by mechanical addition and retain

(Turn to Page 54)

TABLE I

Comparison of Silicone-Alkyds Obtained

By Mechanical Addition and Chemical Combination

Property	Mechanical Mixture	Chemical Combination
Compatibility	Sensitive (As Silicone)	Versatile (As Alkyd)
Silicone Content	Limited	Unlimited
Cure Time (Baking)	90 min. - 400°F.	30 min. - 400°F.
Air Drying Product	Difficult to Obtain	Easy to Obtain

Louis J. Reizenstein

Reizenstein, Pres. of Falk Addresses Louisville Group

Mr. Louis J. Reizenstein, President of Falk & Company recently addressed a group of over one hundred members and guests of the combined meetings of the Louisville Paint and Varnish Production Club and the Louisville Paint, Varnish & Lacquer Association held at the Seelbach Hotel.

Prior to Mr. Reizenstein's address, he showed a technicolor sound movie on, "The Story of the Menhaden" which pictured in a dramatic fashion the search for and capture of this little known, but important industrial source of drying oil. The picture also demonstrated the varied uses of menhaden oil and meal.

Following the showing of the picture, Mr. Reizenstein gave an address on "Economics of Various Fats and Oils in the Current World Picture." Mr. Reizenstein traced the economic relationships of the different drying oils and the necessity of constant watching and revision of formulations in order to take full advantage of changing developments.

•

Whittaker Appoints Export Manager

After four years in the export department of Whittaker, Clark & Daniels, Inc., distributors of minerals, colors and pigments, 260 West Broadway, New York City, Elmer G. Stillwaggon was, on February 1, promoted to managership of that department. He succeeds Louis Storch who has become Whittaker's import manager.

R. Hyde of Nuodex Speaks On Mildew at Biloxi Confab

New and more nearly accurate techniques of diagnosing mildew on painted surfaces were described by Robert Hyde of Nuodex Products Co., Inc., of Elizabeth, N. J., at the recent meeting of the Southern Federation of Paint and Varnish Production Clubs.

"New Developments in the Diagnosis of Paint Mildew," the paper read by Mr. Hyde, was written by Milton Goll, chief of the Nuodex Microbiological Laboratories, and two associates, H. D. Snyder, mycologist, and Herman Birnbaum, bacteriologist.

Among the instruments used is a stereoscopic microscope, which gives a three dimensional view of the sample. With it, the scientist can more exactly determine the presence of fungi and differentiate it from dirt.

Standard microscopes are also employed using both direct and vertical illumination. The vertical illuminator has been used for many years in studying the surfaces of metals, but its use in the paint industry is new. Many discolorations do not stand out distinctly as mildew when old methods of diagnosis are used. But with vertical illumination, the criss-cross, winding strands of the fungus come into clear sharp outline.

By these methods the scientist can classify the organism present on the paint film, without having to use time-consuming cultural techniques. Also, these latter techniques often were not reliable since the paint-destroying mold might be hidden by other surface molds which multiplied more rapidly. Another important feature of the new method is that subsurface types of mildew can be detected.

The Nuodex laboratories have been studying the problem of mildew on paints for the past 10 years. As a result, manufacture of a fungicide especially designed for protecting paints was started in 1944. Studies of the problem reveal that paints on more than 2 out of 3 houses which appear to be dirty really have been discolored by mildew.

•

Clark of Am. Can Heads Can Manufacturers Research

Dr. Berton S. Clark, scientific director of American Can Company's Research and Technical Department, has been appointed chairman of the Can Manufacturers Institute Research Committee for 1952.

This committee is responsible for research on technical problems of industry-wide importance. Development of constructive methods of tin conservation for national defense is its most important current project.

N. Y. Club to Hold Forum at Newark College on May 5th

The New York Paint and Varnish Production Club has arranged for a forum on "New Methods of applying coatings." The meeting is to be held on Monday evening, May 5th at 7:45 P.M. at the Newark College of Engineering on High Street in Newark, New Jersey.

Frederick M. Damitz, Chairman of the Educational Committee has arranged the program as follows:

1. Mr. Robert Phair of Bell Telephone Laboratories who will speak on the super-heated steam spray gun and other methods of applying heated coatings.
2. Mr. Richard F. Wiggins, President of Gyromat Corporation, who will speak on the Gyromat and the Gyromat Centrifugal Sprayhea.
3. Mr. G. A. Chutter of the Ransburg Electric-Coating Corporation who will speak on the Ransburg Electrostatic Spray Process No. 2.

The various talks will be accompanied by demonstrations and a movie.

After the panel discussions, an opportunity will be offered to inspect the New Paint and Varnish Laboratory at the College, after which, refreshments will be served.

•

L. H. Conklin of RBH Addresses N.E. Club

"Basically, dispersion is still a mechanical problem even though surface active agents are an aid," declared Mr. L. H. Conklin, Jr. of R-B-H Dispersion Division of Interchemical Corp. at the monthly meeting of the N. E. Paint & Varnish Production Club. Mr. Conklin explained the action necessary to disperse pigment and discussed the advantages and limitation of six types of dispersion equipment. Using titanium dioxide and optimum formulations for each type of equipment Mr. Conklin showed how his organization has found that best dispersions are produced by machines operating at higher viscosities.

•

United Lacquer Names Russell Control Chemist

Appointment of H. William Russell, a wartime Navy pilot, as control chemist in the research laboratory of the United Lacquer Manufacturing Corporation, 1001 W. Elizabeth Ave., Linden, N. J., was announced recently.

Mr. Russell has been engaged in the research and development of lacquers, enamels and other finishes since 1945, the year he left the Navy. He had been in the service three years.

During the six years he has been in the paint research field, Mr. Russell has specialized on lacquers and government finishes.

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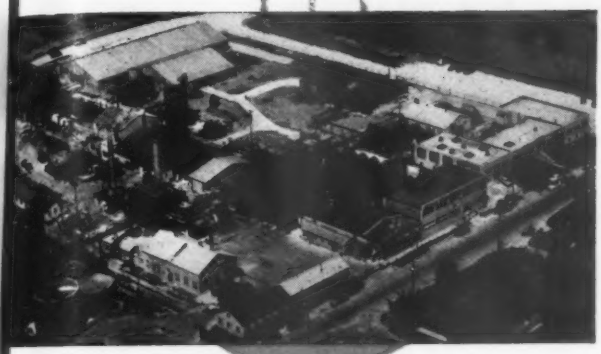

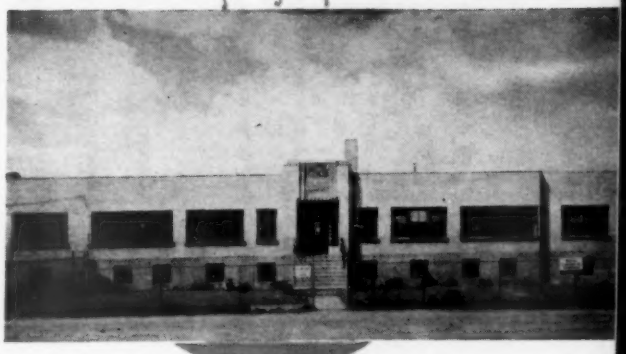

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REPRESENTATIVES IN PRINCIPAL CITIES

H. E. Hall

Metals Disintegrating Reelects H. E. Hall as President

The reelection of H. E. Hall as its president, is announced by Metals Disintegrating Company, Inc., Elizabeth, New Jersey, manufacturers of Metal Pigments, Metal Powders and Metal Abrasives.

The officers elected at the annual meeting of the Board of Directors, held March 13th include: H. E. Hall, President and Treasurer; Grover M. Hermann, Chairman of the Board; Julius F. Sachse, Vice President; Mary Sohayda, Secretary; Joseph C. Newell, Assistant Secretary; Paul P. Weber, Assistant Secretary; James M. Coyle, Assistant Treasurer.

The directors elected at the annual meeting of stockholders, held the same date, include: H. E. Hall, Harry J. Hemingway, Grover M. Hermann, Edward F. March, Herbert J. Osborne, Theodore Pearson, and Robert E. Pflaumer.

•

Ken Swarthout Named Technical Director of McCloskey Varnish

H. B. Almond, sales director of the McCloskey Varnish Company, Philadelphia, announced the appointment of Mr. Kenneth L. Swarthout as technical sales representative.

Mr. Swarthout has been associated with the paint industry since 1920, after graduation from the St. Lawrence University. His first position was with the Aluminum Company of America, and for the past 21 years he has been associated with the Thibaut-Walker Company, Long Island City.

Mildew is Chief Cause of Discoloration of Paint

Mildew not smoke and dirt — is the chief cause of discolored paints on homes throughout the United States. Two out of three homes which need repainting because of discoloration have been attacked by mildew, according to the results of a recently completed study released here recently. Made by the laboratories of Nuodex Products Co., Inc. of Elizabeth, N.J., manufacturers of chemical additives for the paint industry, the study included homes in such widely separated states as Maine, New Jersey, Tennessee, Georgia, Ohio, Minnesota, North Dakota, Missouri and California.

Samples of discolored or "dirty" paint from more than 600 homes were analyzed during the past year. On 68% of these homes mildew was the major cause of the "dirty" appearance. Mildew was frequently a factor contributing to the discoloration of the remaining 32% of the homes studied.

Where mildew is the major cause of paint discoloration, it seldom can be removed by washing or scrubbing. However, there are now on the market paints protected with a patented fungicide, Ad-It, which combats mildew attack and helps the surface maintain its clean appearance over a long period of time.

The accompanying table summarizes the incidence of mildew as a cause of paint discoloration in the areas studied:

Location	No. of Samples	% Samples Showing Mildew as the Major Cause of Discoloration
New Jersey	109	63%
Atlanta, Ga.	95	75%
Cincinnati, O.	101	74%
St. Louis, Mo.	90	68%
Memphis, Tenn.	99	60%
Miscellaneous locations	127	68%
TOTAL	621	68%

Only homes appearing dirty or discolored were chosen for this study. From such homes, investigators received permission to remove samples of the discolored paint. In the laboratories, the samples were examined microscopically by means of special, diagnostic techniques developed at Nuodex.

Two Summer Paint Courses to be Held at N. Dakota Agricultural

North Dakota Agricultural College, Dept. of Paints, Varnishes and Lacquer has announced that two courses in paint technology will be presented this summer. Both courses are under the direction of Dr. Wouter Bosch.

The Fifth Paint Short Course for beginners will be held June 9-20. There are no entrance requirements and the registration fee will be $25.00. The class will be limited to 25 students.

The Second Paint Refresher Course for advance students will be held June 30-July 12. Requirements for this course will be successful completion of any short course for beginners as conducted by the North Dakota Agricultural College, or two years of industrial experience. Registration fee will be $35.00 and is limited to fifty students.

The beginner's course will be composed of 20 lectures, 10 discussion periods and 10 laboratory sessions. In the lectures, all important raw materials, the manufacture, testing and application of paints and varnishes will be discussed. In the laboratory, the students will cook various types of varnishes and make paints, employing single, roller, triple roller, Hy-R-Speed and pebble mills. Various properties of paint films will be studied and discussed.

The purpose of the Advanced Refresher Course is to acquaint men in the paint industry with the latest developments in the field of oils, resins, pigments, solvents, and driers. Eight specialist will participate in this course. They will lecture on the newest developments and lead discussion and question and answer periods.

For complete details on both of these courses write to Dr. Wouter Bosch, Dept. of Paints, Varnishes, and Lacquers, North Dakota Agricultural College, Fargo, N. D.

•

National Gypsum Acquires Wesco Waterpaints

National Gypsum Co. has recently announced the acquisition of Wesco Waterpaints, Inc., including plants, working capital and good will.

The acquisition will round out National Gypsum's paint line by adding Wesco's line in water-thinned paste paints, dry powder, exterior masonry paints and interior rubber base paints

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NEWS DIGEST

Sid Levinson

Sid Levinson Appointed Tech. Director of D. H. Litter Lab.

Before joining Litter Co., Sid Levinson was Technical Director and Plant Manager of the Garland Co., Cleveland, Ohio, Vice-President of Adco Chemical Co., Newark, N.J., President of Industrial Consulting Labs., New York City.

He received his Bachelor of Science & Engineering and Masters Degree Chemical Engineer. Is a Fellow of American Institute of Chemists, member of American Chemical Society, American Society of Testing Materials (ASTM), has been active in Paint & Varnish Production Clubs.

•

Sound Color Film Shows Corrosion in Action

Entitled "Corrosion in Action", this sound color film — which is in three parts of two reels each — shows how corrosion works to cause an annual loss in industry and elsewhere estimated at over six billion dollars. It also shows how this damage can be avoided or controlled by various means, such as by the selection of corrosion-resistant materials, by the development of new alloys to meet given situations, by the use of electric currents to provide cathodic protection, and by other methods.

The film has been so produced that it can be shown in one part, in any combination of two parts, or in the full three-part length — depending on the time available. Each part requires 20 minutes showing time.

Almost every technique known to the motion picture industry was used in the filming of the picture, including animated drawings, slow motion dissolves and time elapse photography. In producing it, films were made at the big testing stations of the Kure Beach corrosion testing project, near Wilmington, N. C.; at the project's new laboratory at Harbor Island, N. C.; in industrial plants in various parts of the country; and elsewhere. The film took approximately a year to produce.

"Corrosion in Action" was made essentially for technical, educational and industrial groups, though its treatment is such that it can be understood by non-technical audiences. It will be released for use in schools, colleges, industrial plants, and before technical societies. Bookings can be made through the Corrosion Engineering Section, The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

Federation Has New HQ

As of April 1, 1952, the Federation of Paint and Varnish Production Clubs has occupied a new office at 121 South Broad St., Philadelphia 7, Pa.

The new location is in the heart of the Philadelphia business district convenient to all transportation and hotel facilities.

•

M. M. Carmody Appointed Sales Mgr. at Ferro Chemical Corp.

David L. Cable, vice president in charge of sales, Ferro Chemical Corporation, Bedford, Ohio announces the appointment of M. M. Carmody as sales manager for their products of driers, fungicides and vinyl stabilizers to the paint and varnish, textile and plastic industries.

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Neo-Fat 3R is an improved unsaturated fatty acid material, produced under exacting quality control by a new low temperature solvent crystallization process. When used to formulate alkyd resins, it gives faster drying and non-yellowing finishes. Its lower titer means this chemical can be exposed to temperatures as low as 5°C without the slightest solidification. Neo-Fat 3R's high iodine values and low saturated fatty acid content yield more double bonds per gallon of fatty acids, contributing better dry and harder films to alkyd resin finishes.

Faster processing time and brilliant color, which carries over into the finished product, are other important advantages of this improved chemical. Neo-Fat 3R has the following specifications: titer, 5°C max.; iodine value of 140 to 145; color (Lovibond 5¼") 1.2R – 12Y max.; acid value of 197 to 202; maximum unsaponifiable content 0.5%; and moisture, 0.2% maximum. Average composition is: 44% oleic, 55% linoleic, 1.0% linolenic maximum, and a trace of saturated fatty acids. Write today for technical Bulletin A-1, which gives complete information and formulas on Armour's Neo-Fat 3R.

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NEWS DIGEST

G. W. Huldrum, Jr.

Shell Elevates Huldrum

Mr. G. W. Huldrum, Jr., has been appointed Sales Manager of the Western Division of Shell Chemical Corporation.

In making the announcement, Mr. L. V. Steck, Vice President, said that the creation of this position was another step in the strengthening of Shell Chemical sales and customer service to meet the expanding growth of agriculture and industry in the West.

•

1952 Organic Coating Conference

The Gordon Research Conferences sponsored by the American Association for the Advancement of Science for 1952 will be held from June 16 to August 29 at the New Hampton School, New Hampton, N. H. Meetings are held in the morning and in the evening Monday through Friday, with the exception of Friday evening. The afternoons are available for recreation, reading, resting, or participation in discussion groups as the individual desires.

Program for Organic Coating Conference:

June 16 — L. E. Hoag: Properties of Very Thin Coatings. H. H. Uhlig: Chemistry and Physics of Metal Surfaces.

June 17 — H. Rosenbloom: Chemistry of Wash Primers. W. M. Bright: Adhesion and the Adhesive Action of Thermoplastic Films.

June 18 — F. W. Reinhart: Deterioration of Polymeric Coatings. S. C. Horning, E. B. Fitzgerald: Deterioration of Alkyd and Oleoresinous Coatings.

June 19 — W. K. Asbeck, J. T. Bergen: Flow Properties of Pigmented Systems. E. I. Stearns: Measurement of Color and Appearance of Coatings.

June 20 — F. Scofield: Test Method and Testing Coatings. R. W. Quarles, chairman, Henry F. Grinsfelder, vice-chairman.

Request for attendance at the conferences, or any additional information should be addressed to W. George Parks, Director, Dept. of Chemistry, Rhode Island State College, Kingston, R. I.

•

Prospectus for 1952 Paint Show

The prospectus for the Paint Industries' Show of 1952 has been released and space reservations are being accepted.

This year the Show will be held at the Palmer House, Chicago, Ill., and will open on Tuesday, November 18, continuing through Saturday, November 22. The early opening will afford the members of the National Paint, Varnish and Lacquer Association an opportunity to visit the Show and see the exhibits.

Space available for the Show this year is limited to 100 exhibit spaces.

Each year the suppliers to the decorative and protective coatings industry use the Paint Industries' Show to introduce new materials and equipment to the assembly of executives, technologists, production engineers and others attending the annual convention of the National Association and the Annual Meeting of the Federation of Paint and Varnish Production Clubs.

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. . . *INCREASES MILL ROOM CAPACITY.* SYLOID 308 is a finely-sized synthetic silica of extremely high purity designed to produce a lower gloss finish. Less flatting agent is required . . . mill room capacity is often doubled. Rigid production controls insure a uniform product for uniform results.

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R. J. Baumann

R. J. Baumann Heads G-E Silicone Products

Robert J. Baumann of the General Electric Company's Chemical Division, has been appointed sales manager of silicone products, with headquarters at Waterford, N.Y.

Mr. Baumann is a member of the Commercial Chemical Development Association, the Chemical Market Research Association, the American Chemical Society, and the Chemists' Club of New York.

•

Venuto of Binney & Smith Addresses Detroit Club

A recent meeting of the Detroit Paint & Varnish Production Club was addressed by L. J. Venuto, Director of Research, Binney & Smith Co. His talk, "Carbon Black and the Influence of the Vehicle as a Dispersing Medium," was very favorably received, according to an officer of the Club, who said that attendance was unusually high. He characterized Mr. Venuto's address as "enjoyable . . . . . and thought provoking." The interest developed was indicated by the lively question period which followed the talk. The meeting took place in the Horace Rockham building.

•

Atlas Lowers Sorbitol Prices

The price of Atlas "Sorbo" (70% d-sorbitol solution) is reduced one-half cent per pound in tank car quantities, the Industrial Chemicals Department, Atlas Powder Co., Wilmington, Del., announced recently. Other grades of Atlas sorbitol and related polyols, such as Sorbitol Special (Atlas sorbitol and anhydrides solution) and "Arlex" (Atlas commercial sorbitol solution) are being reduced from one-fourth cent to one cent per pound at the same time.

This price reduction of "Sorbo" is the fourth since 1946 when the present process of production first was operated. It represents an unbroken trend of reduced prices as production has been increased during that time.

•

N. Y. Paint Travelers Study Pension Plan

The Special Welfare Committee of The New York Paint Travelers Inc. has been devoting considerable research and study to pension plans for the membership.

At a recent meeting held at Midston House, N.Y.C., this Special Welfare Committee, headed by Harry Kohn drew up a complete plan of action for the promulgating of pension activity.

Up to this time great interest has been indicated by the employers in the New York area. Even greater interest is expected in the future as plans are unfolded.

•

E. Johnson Heads Resin Sales at Barrett

Mr. E. A. Johnson has been appointed District Manager in the Resin Sales Section of The Barrett Division, Allied Chemical & Dye Corporation. Mr. Johnson, formerly associated with the Borden Company's Chemical Division, will handle sales throughout the eastern district for Barrett's developing resin-sales program.

SP-28

100% PURE PHENOLIC RESIN

- Melting Point (Capillary) 300-325°F
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NEWS DIGEST

George A. Wells

Bakelite Appoints G. Wells to Coating Materials Division

George A. Wells (above) has been appointed assistant manager of the Coating Materials Division, Thermosetting Department, by Bakelite Company, a Division of Union Carbide and Carbon Corporation.

Employed by Bakelite in 1941, Mr. Wells spent two years in the Bakelite Development Laboratories at Bloomfield, N. J. He was transferred to St. Louis, Mo., where he served in that territory as a sales engineer for eight years. He was brought to New York as assistant to Howard Smith, Manager of Bakelite's Coating Materials Division.

•

Aula Chemical Acquires H. V. Walker Company

Aula Chemicals, Inc., manufacturer of textile and allied printing colors, formerly at 131 Dey St., Jersey City, N. J., has taken over the plant of H. V. Walker Co., manufacturers of industrial finishes (lacquers & enamels) and similar products, at 714 Division St., Elizabeth, N. J.

Aula Chemicals, Inc., has taken over the entire production facilities of the Walker plant, adding to it the former Jersey City production equipment of Aula. In addition, quantities of new equipment will be added to complete a plant modernization program now under way. Both the Aula line of textile colors and the Walker line of industrial finishes are now manufactured by Aula. The H. V. Walker Co. will continue to sell the Walker line of industrial finishes.

The acquisition of the Walker site and facilities gives Aula 20 times its former manufacturing, storage, office and laboratory space, located on 4½ acres of land. Both capacity and personnel are expected to double within six months, according to Dr. Auer & Dr. Balassa.

Aula colors are resin emulsions of the oil-in-water type, where water is the continuous phase. They are water-dilutable, as contrasted with the conventional pigment printing emulsion colors which dilute only with solvents.

•

A. S. Butler, Pres. of McDougall-Butler Dies

Andrew S. Butler passed away peacefully on March 25th after a long illness.

His interests included all matters of civic activities, politics, sports, current events and mostly "people" of all classes and in all walks of life. His affections and ambitions, however, were centered in his family and in his business.

He built his paint business from a low ebb in its affairs to a successful enterprise. In steering the fortunes of this business, he more often sought to raise others with him rather than to rise above them.

•

Canco Officer Named to Board of Directors

L. W. Graaskamp, vice president, executive department, of American Can Company, has been elected to that company's board of directors.

. Mr. Graaskamp, was vice president in charge of sales from 1949 to 1951. Early last year he was assigned to broader responsibilities to work directly with the principal executive officers in the overall administration of the company.

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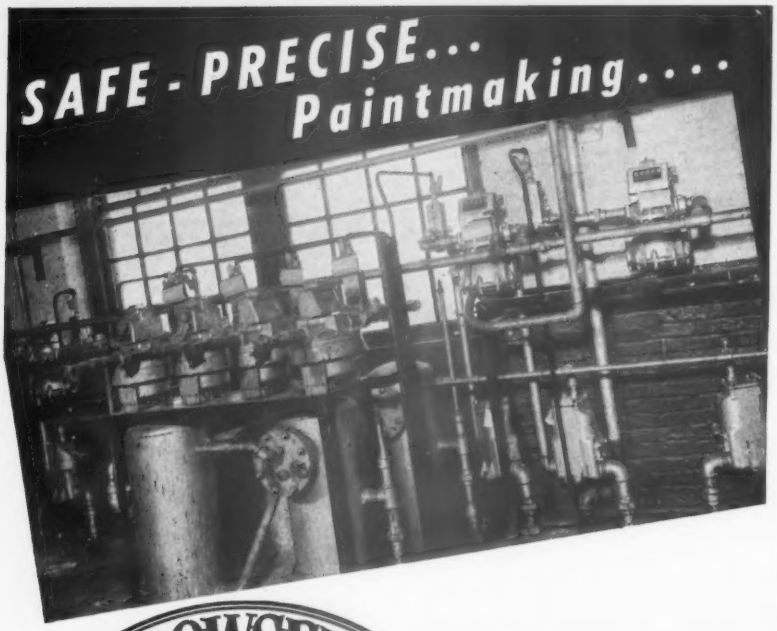

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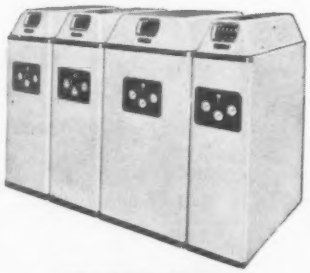

AUTOMATIC BLENDER for 2 or more liquids. Ingredient increments as small as 1/20% if needed.

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CALENDAR OF EVENTS

May 2-3. Joint Meeting of Dallas-Houston Paint and Varnish Production Club, Stoneleigh Hotel, Dallas, Tex.

May 23-24. Spring Symposium of Pacific Northwest Paint and Varnish Production Club, New Washington Hotel, Seattle, Wash.

June 16-20. Gordon Research Conferences on Organic Coatings, New Hampton School, New Hampton, N.H.

June 23-27. ASTM Annual Meeting, Hotel Statler, New York.

Sept. 14-19. Fall Meeting of Div. of Paint, Varnish and Plastics Chemistry, ACS, Chalfonte-Haddon Hall, Atlantic City, N.J.

Nov. 17-19. National Paint, Varnish and Lacquer Ass'n. Annual Convention, Palmer House, Chicago, Ill.

Nov. 20-22. Federation of Paint and Varnish Production Clubs Annual Meeting, Palmer House, Chicago, Ill.

Nov. 18-22. Paint Industries' Show, Palmer House, Chicago, Ill.

Production Club Meetings

Baltimore, 2nd Friday, Belvedere Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Cincinnati Club;
Dayton — Nov., Feb., April, Van Cleve Hotel;
Indianapolis — Sept., Claypool Hotel;
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, Last Monday, El Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Seven Seas Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, Puritan Hotel, Boston.

New York, 1st Thursday, Building Trades Employers Assn.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

St. Louis, 2nd Tuesday, Forest Park Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday, 40-8 Club, Buffalo.

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PATENTS

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PATENTS AND COPYRIGHTS

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Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

Emulsion Copolymerization of Styrene with Bodied Oils

U. S. Patent 2,586,092. Ralph Sidney Robinson, Liverpool, England, assignor to Reichhold Chemicals, Inc., Detroit, Mich.

A process which comprises suspending (1) a member of a group consisting of (*a*) a bodied oil selected from a group consisting of bodied linseed oil and bodied dehydrated castor oil, and (*b*) a glycerol phthalate alkyd resin modified by such bodied oil, and (2) styrene in an aqueous medium, and subjecting said substances to copolymerization at a temperature of 55° to 65°C.

Styrene Copolymers

U. S. Patent 2,586,571. John Joseph Sleightholme, Carlisle, England, assignor by mesne assignments, to the Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio.

A process for the production of a copolymer which comprises heating styrene with the unsaturated aromatic extract obtained from lubricating oils treated by the Edeleanu process, the ratio by weight of styrene to extract being from about 2:1 to 1:5.

A process according to claim 1 wherein a higher fatty soap-forming acid is incorporated in the reaction mixture.

Water-Emulsifiable Metallic Paste Pigments

U. S. Patent 2,587,268. Wayne B. Roberts, Mount Lebanon, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania.

A water-emulsifiable, metallic paste pigment formulation comprising 23 to 45 per cent metal flake, 3 to 12 per cent volatile hydrocarbon, at least one fatty acid in amounts between 0.15 and 2 per cent selected from the group consisting of stearic, palmitic, oleic and ricinoleic acids, in admixture with 9 to 26 per cent tall oil, at least one water-soluble, soap-forming emulsifier in amounts between 2 to 10 per cent selected from the group consisting of carbonates of sodium, borates of sodium, the isopropanolamines, the ethanolamines and morpholine, and 45 to 85 per cent of the emulsifier present being casein, and at least one substantially water-free, water-soluble carbohydrate in amounts between 15 to 50 per cent selected from the group consisting of starch, sucrose, dextrose, maltose, lactose and levulose, said metallic paste pigment formulation being characterized by its stability, paste-retaining consistency and freedom from agglomerate formation under storage conditions sealed against atmosphere.

A water-emulsifiable, metallic past pigment formulation comprising 23 to 4 per cent metal flake, 3 to 12 per cen volatile hydrocarbon, at least one fatt acid in amounts between 0.15 and 2 pe cent selected from the group consistin of stearic, palmitic, oleic and ricinolei acids, in admixture with 9 to 26 per cen tall oil, at least one water-soluble, soap forming emulsifier in amounts betwee 2 to 10 per cent selected from the grou consisting of amino compounds 2-amino 1-butanol, 2-amino-2-methyl-1-pro panol, 2-amino-2-methyl-1,3-pro panediol, the isopropanolamines, th ethanolamines, morpholine and mono n-butyl amine, and at least one substantially water-free, water-soluble carbohydrate in amounts between 15 to 50 per cent selected from the group consisting of starch, sucrose, dextrose, maltose, lactose and levulose, said metallic paste

Here is an improved shingle stain oil. With its use you can formulate pigmented or non-pigmented oils of better quality at less cost. LX-767 has a mild odor, good penetration and is uniform. Its light color means more economical colored oils, which, when properly pigmented, will show no rub-off.

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A-42

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latest in the Celanese Series of Industrial Solvents developed especially for Performance and Economy

N-propyl acetate is the first in a series of esters to be produced by Celanese. It is a medium-boiling, low viscosity solvent with a pleasant odor and excellent blush resistance. An economical replacement for such solvents as MIBK, butyl acetate-ethyl acetate combinations, and secondary butyl acetate, Celanese* n-propyl acetate is now available in 90%-92% concentration—in volume quantities to meet both large and small scale requirements.

With the addition of n-propyl acetate, Celanese can now offer a diversified line of organic solvents, providing formulators with the flexibility and economy of split shipments in compartmented tank trucks and cars at bulk prices.

Investigate the cost-saving possibilities of n-propyl acetate. A Celanese technical representative will be glad to review your formulations, and demonstrate how Celanese solvents can give you the performance you need. Write for technical bulletin N-29-1.

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Properties

Color.....15 APHA
Spec. Grav.....0.880—0.885 @ 20/20°C
Boil. Pt.....95°C—103°C
Ester Content...90%—92%

Solvents by Celanese

Solvent 203	Acetone
Solvent 301	Methanol
Solvent 601	n-Propyl Acetate
Solvent 901	Butyl Alcohols

*Reg. U.S. Pat. Off.

pigment formulation being characterized by its stability, paste-retaining consistency and freedom from agglomerate formation under storage conditions sealed against atmosphere.

Styrene-Drying-Oil Copolymers

U. S. Patent 2,586,572. John Joseph Sleightholme, Carlisle, and Wallace Thomas Craven Hammond, London, England, assignors, by mesne assignments, to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio.

A process for the production of a copolymer which comprises heating a mixture of styrene with the unsaturated aromatic extract obtained from lubricating oils treated by the Edeleanu process and with a polyhydric alcoholic mixed ester containing unsaturated drying oil fatty acid radicles, the ratio by weight of styrene to extract being from about 4:1 to about 1.2:1, and the mixed ester comprising from 10% to 44% by weight of the mixture.

Polymers of Styrene With Unsaturated Fatty Acids

U. S. Patent 2,586,593. Frank Armitage, London, and John Joseph Sleightholme, Carlisle, Cumberland, England, assignors, by mesne assignments, to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio.

A process for the manufacture of interpolymers comprising heating a compound selected from the class consisting of styrene, nuclear alkyl substituted derivatives thereof and nuclear halogen substituted derivatives thereof and a compound selected from the class consisting of drying oil fatty acids and polyhydric alcoholic esters thereof, in the presence of an alpha terpene which has been activated by blowing with a gas comprising molecular oxygen.

Pigment Coloring

U. S. Patent 2,586,188. Alfred E. Van Wirt and George F. Jones, Glens Falls, N. Y., assignors to Imperial Paper and Color Corporation, Glens Falls, N. Y., a corporation of New York.

The method of producing a colored surface on an article which comprises applying to the article a thickened aqueous pigment paste which is negatively charged, and subsequently applying to the pigment paste on the article an aqueous dispersion of a water-dispersible resin of the group consisting of melamine-formaldehyde and urea-formaldehyde, said resin being cationic, the cationic resin having been produced by temporarily subjecting the resin in the presence of triethanolamine to a pH of at least 1.5 with acid and then buffering the charged resin to a pH of about 6, and heat-treating the resin applied to the article to cure the resin.

Vinyl Tall Oil Coatings

U. S. Patent 2,587,497. Paul E. Marling, Dayton, Ohio, assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A coating composition which consists essentially of a substance made by heating in an inert atmosphere at a temperature of 400 to 600°F. vinyl tall oil esters and from 0.01 to 5 percent by weight of anthraquinone, and a solvent for said substance, said percentages being based on the weight of the ester.

Peroxide Treatment of Fatty Oils

U. S. Patent 2,588,902. Leonard P. Wiebe, Long Beach, Calif., assignor to Shell Development Company, Emeryville, Calif., a corporation of Delaware.

A process of improving the drying properties of fatty oil having an iodine value of at least 120 which comprises heating said oil at about 100°C. to 250°C. in the presence of a peroxide compound containing a tertiary-alkyl peroxy radical.

Phenolic Varnishes

U. S. Patent 2,587,578. John Leslie Jones, Los Angeles, Calif., assignor to Libbey-Owens-Ford Glass Company, Toledo, Ohio, a corporation of Ohio.

A method of preparing a resin by reacting 0.5-2 mols of formaldehyde with 1 mol of a compound of the class consisting of mono-substituted phenols whose substituent in each case is a mono-olefinic hydrocarbon radical and polymers thereof, characterized (1) by said radical being in the para position and having from three to four carbon atoms and (2) by carrying out the reac-

Chats about Finishes

HOT LACQUER FOR DEFENSE USE

by

J. B. WIESEL

Asst. to the General Manager
Hercules' Cellulose Products Dept.

With the adoption of hot-sprayed lacquers for aircraft, tanks, ammunition, and other military items, new and important production gains have already become evident. Douglas Aircraft Company, for example, reports finishing time reduced by as much as 50%. Small wonder, then, that Ford's new tank assembly plant at Livonia, Michigan, will use hot lacquer exclusively for finishing—saving the substantial expense of baking ovens, besides.

Time and performance studies reveal many collateral benefits in fewer coats, saving in solvents, greater per gallon coverage, better flowout, and no blush.

The increasing trend to hot lacquer presents new opportunities for industrial sales and new markets in defense and civilian plants. Write, and I'll send latest details on the process and its applications.

J. B. Wiesel

Cellulose Products Department

HERCULES POWDER COMPANY
INCORPORATED
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ICS2-3

tion in the presence of, as a catalyst, a zinc salt of an organic acid whose strength is not substantially greater than that of formic acid, whereby there is obtained an oil-soluble resin that produces varnish coatings of greatly improved color.

Cement Paint Composition

U. S. Patent 2,588,438. Robert L. Waide, Houston, Tex.

A high silica content paint composition comprising, substantially sixty percent white Portland cement containing approximately twenty-five percent silica, substantially twenty-two percent fibrous talc containing approximately sixty percent silica, substantially ten percent calcium carbonate having a particle size range of .5 to 10 microns, substantially seven percent sodium chloride and approximately one percent calcium stearate.

Modified Drying Oil Coating

U. S. Patent 2,588,821. Lyle M. Geiger, Edgewood, Pa., assignor to The Neville Company, Pittsburgh, Pa., a corporation of Pennsylvania.

In a method of making a drying oil base coating composition, the steps comprising heating to at least about 450°F., a mixture of fatty drying oil and alcohol soluble condensation product of ordinary phenol (C_6H_5OH) and a natural cyclic terpene, said condensation product existing in a crystalline form melting at 98°C., and in a metastable resinous form, and cooling the product of said oil and condensation product.

Product of cooking fatty drying oil and not over about 8.6 per cent by weight of cis 1-8 bis (parahydroxy phenyl) menthane.

Organosiloxane Coating

U. S. Patent 2,588,393. Toivo A. Kauppi, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich., a corporation of Mich.

An organosiloxane composition comprising a mixture of 38 to 62 per cent (based on siloxane content) by weight of a methylhydrogensiloxane fluid of the general formula

$$(CH_3)_aH_bSiO_{\frac{4-a-b}{2}}$$

in which a has a value of from 1.0 to 1.5, b has a value of from 0.75 to 1.25, and the sum of a and b has a value of from 2.0 to 2.25; and from 62 to 38 per cent (based on siloxane content) by weight of a dimethylpolysiloxane high polymer which is soluble in benzene and which has a plasticity number greater than 30 expressed in thousandths of an inch, said plasticity number being determined upon a 4.2 gram test sample at 25°C. with a 3 minute duration of load in accordance with ASTM-D926-47T.

Drying Oil By Dehydrochlorination

U. S. Patent 2,587,588. David A. Berry, Painesville, Ohio, assignor to Diamond Alkali Company, Cleveland, Ohio, a corporation of Delaware.

The method of making a drying oil by dehydrochlorinating a chlorinated paraffinic hydrocarbon having between 18 and 36 carbon atoms and having an average between 4 and 10 chlorine atoms to each molecule to a point where said molecules have less than one chlorine atom on the average, which includes the steps of reacting said chlorinated hydrocarbon with alkali metal hydroxide in a solvent chosen from the group of dihydric alcohols and dihydric ethers having from 2 to 6 carbon atoms in the presence of a catalyst chosen from the group of titanium dioxide and zirconium dioxide, and separately recovering the dehydrochlorinated product.

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•

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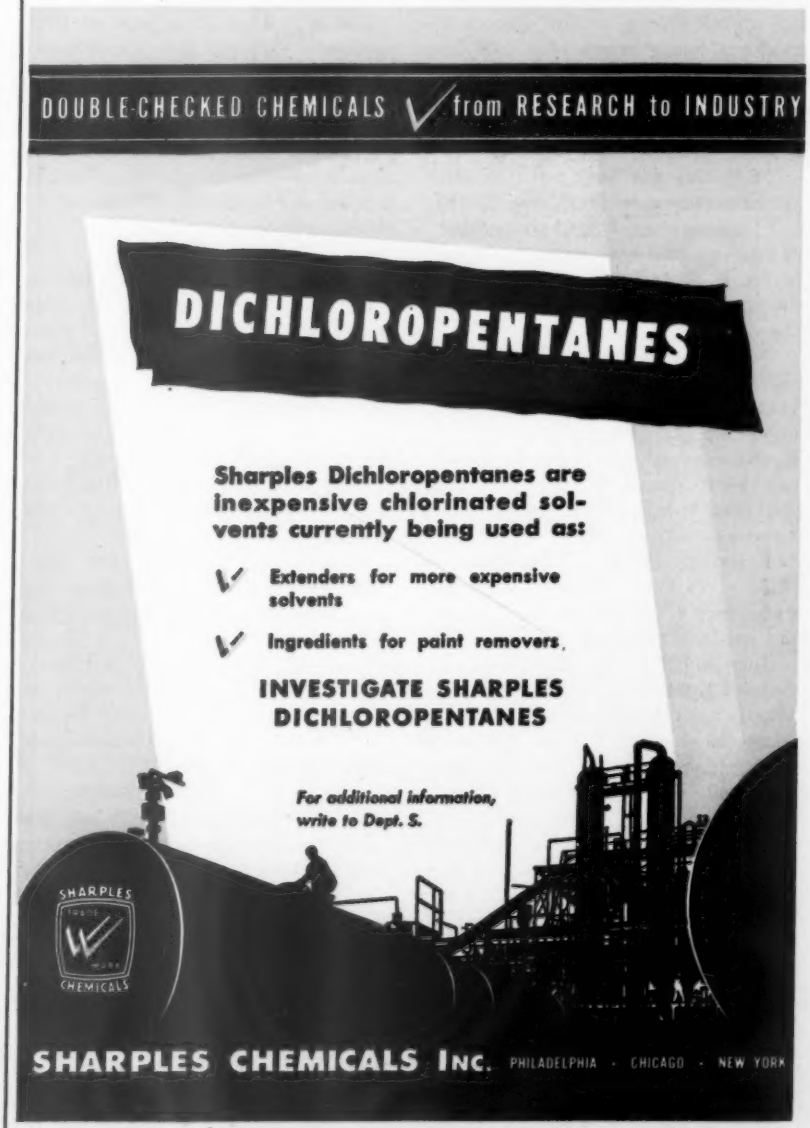
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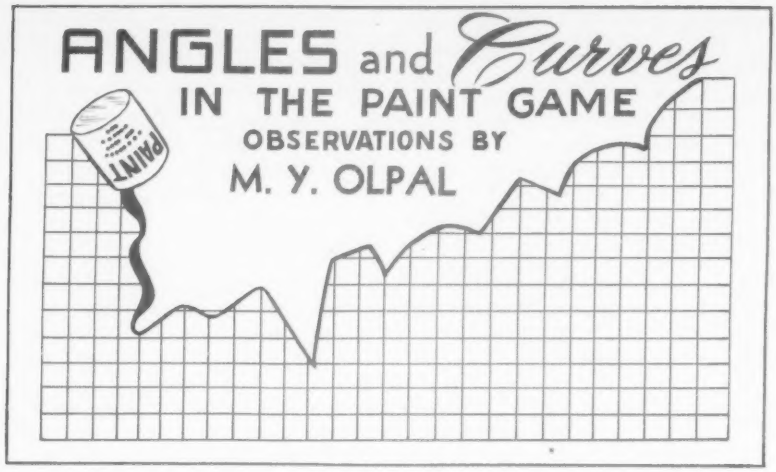

Jane stood at the file cabinets with her back to me. I was enjoying myself gazing at the smoothly modeled figure when she twisted around to face me. I smiled in a half embarrassed way — just like a small boy who had been caught stealing jam.

"You like my new outfit?" she asked as she twirled back and forth.

I grinned as I looked at the clothes for the first time. "To be perfectly frank, Janie, I didn't know it was a new outfit. It was the old chassis I was admiring."

"Oh, you —," Jane pouted as she slammed the file case closed. It caught the folder she was holding in her hand. When she had freed it, she minced over to her desk and sat down demurely. "If you can get your mind on the business, I have a question."

I smiled again. "My mind is always on the business. It's the definition of business that might get me into trouble."

Jane let that one slip by as she opened the folder. "That's just it, Olpal. A definition of business. How is it that we get business away from some of the big boys and still beat out the little boys?"

"Not always," I observed.

"Of course not. But I'm puzzled. You take, we have a fair sized lab, but we still don't have the facilities of the really big paint companies. How do we get business away from them?"

I tapped on my desk as I thought how best to answer her question. "Look, Janie. This whole affair revolves around the principle of private enterprise — the desire to make money. It's the oil for the wheels of capitalism."

"I know that," Jane asserted.

"Okay. Then let's look at this picture. When a guy starts out, he's a formulator, salesman, purchasing agent, president all rolled into one. He's got his fingers into everything. He knows where he stands all the time. As a result he can work fast and make decisions fast."

"Yes?" Jane said.

"Well, once he's convinced there's business someplace he can go after it without convincing anybody else. He can get a sample in for test before we — or a larger company — even starts to work on the problem. And many times, the first one there get's the business."

"Well, if you think the little guys are so potent, why do we get the business away from them?"

"Just because they *are* fast. They don't have the time or money to always do a thorough job. Then when trouble comes up — it always does, you know — they fall down on the service. That's when us bigger guys can come in and shine."

"Then the little guys don't last long," Jane surmised.

"Oh, no. I wouldn't say that. Any one little guy might not last long, but there is always new ones coming along. Everybody often feels that the company they work for isn't moving fast enough or isn't operating properly. They hanker for a chance to run their own set up. So there's always more guys starting out. Those that are successful and don't make too many mistakes finally get to be bigger. Just like we did, in fact."

Jane flipped the pages in the folder in an absent minded manner. "Then what would you say was the secret of our success?"

This was the time for a smart answer as I flicked my eyes over the form — and I don't mean the form letter — but, then, I decided to answer the question properly. "The first thing you need is a product. The product has to be good enough to do the job. The second thing, I would say, is that you have to back up the product with service — sometimes it's wine, women, and song, but more often it's straight technical service. And the third thing that will decide if you get new business or retain old business is the personality of the salesman. How well entrenched is he with the purchasing agent or technical staff. So you see, any outfit, if they concentrate on one of these points will succeed in getting business. But the best way to grow the fastest, is to work on all three at all times."

•

N. Y. PRODUCTION CLUB

(*From page 37*)

proper set and dry characteristics. Any amount of silicone can be chemically combined. An optimum amount of chemically combined silicone in a silicone-alkyd has a pronounced effect on weather resistance as is indicated by the following table in comparing different types of pigment in Florida exposure. Table II.

Resin combinations other than alkyd can also be considered and will undoubtedly evolve in whole new classes of protective coatings.

•

Elliot Paint & Varnish Announces Expansion

H. A. Rowland, president of Elliot Paint and Varnish Co., Chicago has announced that ground has been broken for a $200,000 plant expansion program at 4525 Fifth Ave.

The new addition will add 13,000 square feet to present facilities and provide an entire new floor to the present building for general offices as well as 6,000 sq. ft. for manufacturing warehouse, shipping, and receiving. Another innovation will be the installation of a model paint store section. This duplication of a paint store will enable Elliot to instruct and educate paint dealers in the proper merchandising and point of sale display of Elliot's products.

abstracts

Electrical Properties of Pigments in Solvents

Savits, G. Presented before the 1951 General Meeting of the Society of German Chemists.

Observations on the electrophoresis of the pigments in organic solvents have indicated that all pigments within solvents carry an electric charge. Governing factors are:— 1) the solvent groups in which the pigments exhibit a similar behavior, 2) the chemical purity of the solvents, 3) the electrolytic character of the pigments, 4) the presence of ions and wetting agents which may change the electrolytic behavior of the pigments. In principle we differentiate between non-polar and weakly polar solvents. Polar solvents may induce bridge formations of thick agglomerations of non-pulverized pigments: the latter reaction is governed by the presence of a water envelope around the pigment particles, occluded air or dust.

Metallic Catalysts on Polybutadiene Film Formation

Wilborn, F. Dr. and Morgner, J. Presented at the Autumn Meeting of the Society of German Chemists in Leipzig, Oct. 17-20, 1951.

The catalytic action of metallic resinates on vinyl copolymers corresponds closely to their influence on linseed oil. The strongest influence is exhibited by cobalt resinate, followed by manganese resinate. The studies conducted by the authors proved that the drying period-concentration curves are hyperbolas, while the drying period-temperature curves follow the van't Holl's law. It has also been found that the well-known group divisions into the cobalt, manganese, iron group on one hand and the lead, cerium, thorium group on the other hand prevails in this case as well. The authors were able to draw convincing conclusions regarding the mechanism of the drying process from the drying period — weight increase curves.

Activities of Paint Lab At Technical University

D'Ans, J. Dr. Presented at the 1951 General Meeting of the Society of German Chemists.

D'Ans compared the hydrolysis of per-acetic acid and the oxygen transmission of drying substances with the self-accelerating oxidation of the oils and reports on certain observations made at the isomerization of alkalies with regard to the absorption of oxygen by linseed oil fatty acids. The institute also studies the kinetics of formation of alkyd resins and has done some interesting work on the problem of pore formation produced on the application of paint materials by brushing and spraying.

Conjugated Linseed Oil

Boekenoogen, H. A., Blekkingh, J. J. A., and Blonk, N. H. M., Netherlands. Presented at the Elastomers and Plastomers Section, XII International Congress, Sept. 11, 1951.

Although linseed oil has been used as much for many years in the paint and varnish industry, there have been repeated attempts to improve its properties and hence those of the film derived from it. These attempted modifications can be classified as follows:

I Elimination of undesirable substances present in the crude oil;

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II Addition of substances, which generally speaking do not react with the oil;
III Separation of the oil into fractions with different properties;
IV Chemical changes in the oil molecules;
V Condensation or copolymerization of the oil with other substances

Since tung oil occupies a very important place in varnishes, many investigators have tried to shift the double bonds in linseed and soybean oil in order to obtain conjugated systems in these oils. Initial experiments with alkaline reagents and nickel-on-carbon catalysts yielded products which were not completely satisfactory. A specific catalyst for the reaction has now been found which leads to a high degree of conjugation at a temperature, at which no decomposition or polymerization products are formed. Linseed oil then gives a light colored oil with more than 50% conjugation, which acts like a mixture of two parts of tung oil and one part of linseed oil.

From this "immaculately" conjugated oil which is not spoiled by side reactions, the real properties of an oil with less conjugation than tung oil may be evaluated. It appears that such a pure conjugated oil lacks after-tack, which is such a serious imperfection in oils conjugated in other ways.

It is obvious that polymerization takes place more quickly than with linseed oil, but is much easier to control than in the case of tung oil. The stand oil nevertheless has a greater reactivity than normal linseed stand oil, which stimulates the reaction with modified phenol resins. Stand oil from conjugated linseed oil dries much more quickly than that from linseed oil.

For the manufacture of varnishes and enamels this light-coloured conjugated oil has definite advantages, as the elasticity is greater than in the case with tung oil, while the hardness is the same. Moreover, the resistance to aqueous acids and alkalies is good.

Glossier Pigment-Resin Coatings

McDowell and Clark, R. L. Industrial and Engineering Chemistry, Vol. 44, No. 1, 116.

Work was undertaken in an effort to develop a resinous adhesive which would be water-dispersible and yet cure, ultimately, under relatively mild conditions, to a water-insoluble composition.

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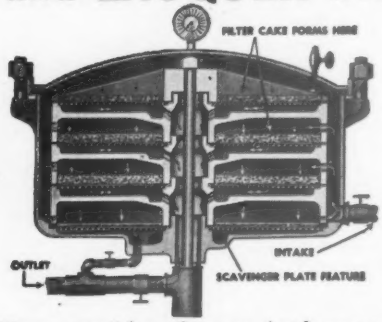

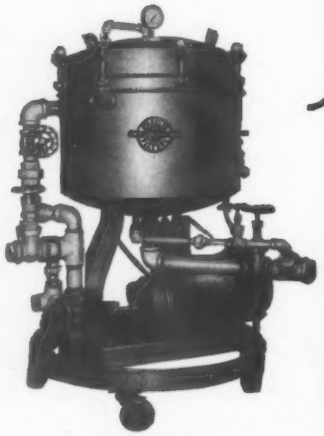

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Styrene-monoalkyl maleate heteropolymers were prepared and found to possess this novel property when used in aqueous ammoniacal solution — films cast from aqueous ammoniacal solutions of styrene-monoalkyl maleate heteropolymers when air-dried or baked were water-insoluble. Films cast from aqueous ammoniacal solutions of styrene-maleic anhydride heteropolymers were water-soluble except when baked at high temperatures.

A resin possessing this novel solubility characteristic may well find application in the adhesive field, where some degree of resistance to water of the ultimate bond is important. It may be applied from an aqueous solution and thus obviate the necessity of employing organic solvents. Applications may also possibly be found in the textile field where, for instance, the resin may be applied as a size from an aqueous ammoniacal solution. Advantage may be taken of its solubility characteristics, which are distinct and different from those of a styrene-maleic anhydride heteropolymer. Styrene-monoalkyl maleate heteropolymers would offer a more water-resistant size. Ultimately, the resin could be removed by contact with alkali.

Water-Insoluble Resin

Heiligmann, R. G. and McSweeney, E. E., Industrial and Engineering Chemistry, Vol. 44, No. 1, 113.

This work was undertaken to provide the printing ink and decorative coating industries with a dry pigment chip which could be stored indefinitely and then dissolved in suitable solvents without mill grinding to form finished compositions.

The resinated-type source of color has been prepared by fusion of zein and pigment. Solutions of these friable color chips are lower in viscosity and retain initial viscosity better than conventional zein inks prepared by ball milling the pigment and protein in volatile solvents or by 3-roll paint milling in glycols. Coatings and prints from the solutions are also glossier and more transparent. These improved properties appear to result from finer disintergration of the pigment particles or from closer association of the pigment with the protein.

By the method described, it is now possible to produce zein pigment chips which will readily dissolve in glycol and alcohol solvents and disperse in water. Such pigment-resin combinations are of interest to both manufacturers and consumers of pigments. In particular, these compositions are of significance to producers of aniline, steam-set, and heat-set printing inks, to color coaters of paper, paperboard, glassine, and cellophane, and to companies that require pigmented colors rather than dyes because of the generally higher resistances of pigments.

Polymerization of Styrene With Drying Oils

Bezman, I. I. and Browning, D. D., Mellon Institute, Pittsburgh, Pa. Presented at the Elastomers and Plastomers Section, XII International Congress, Sept. 11, 1951.

A study has been made of several factors operative in the polymerization of styrene and drying oils in aqueous emulsion, including time and temperature of reaction, catalyst systems, monomer ratio, type of oil, and initial oil state. Emphasis was placed primarily on elucidation of the relation between these variables and the extent of true copolymerization. It was necessary, therefore, to devise methods for separation of reaction products and isolation of true copolymers. A method for the quantitative determination of the oil content of the copolymers was established which employed infrared spectral absorption bands. Although the work being reported must be considered to be of a preliminary nature, it led to several conclusions and serves to delineate some problems which merit further study. It was found that, in general, the amount of true copolymer formed as a result of these reactions is quite small. Copolymerization is affected appreciably by the state of the oil with respect to its oxidative pretreatment, its diene value and its degree of polymerization. Methods for separation of true copolymer from polystyrene and uncombined oil must be refined. Finally, infrared spectroscopy appears to be a promising method for the quantitative determination of the oil content of the copolymers

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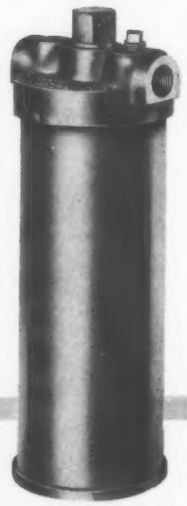

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Drying Oil Modified Glyceryl Phthalate Resins

Funk, Robert H., Chemical Dept., Westinghouse Research Laboratories. Presented at the Elastomers and Plastomers Section, XII International Congress, Sept. 11, 1951.

The reaction of alkali refined linseed oil and glycerol has been investigated to determine the yield of monoglyceride as a function of reaction time at 235°C. in the presence of CaO and PbO catalysts. Analytical data are reported for the determination of monoglyceride content by the periodic acid method of Pohle and Mehlenbacher. The monoglyceride content thus determined has been related to the dilution tolerance of the alcoholyzed product to anhydrous methanol, a commonly used commercial test.

The importance of degree of alcoholysis prior to addition of phthalic anhydride in the preparation of oil modified alkyd resins has been investigated. The critical range of monoglyceride content necessary to insure complete compatibility upon the addition of phthalic anhydride has been determined. Properties are reported for medium oil modified alkyd resins prepared from alcoholysis products with the same starting composition, but varying in monoglyceride content prior to esterification with phthalic anhydride. Resins prepared from an alcoholysis product with minimum monoglyceride content to insure compatibility with phthalic anhydride are found to possess inferior properties as compared to resins prepared from the more completely alcoholyzed product.

Stabilization of Chlororesins In Paint Films

Eickhoff, A. J. National Lead Co. Research Laboratories, Brooklyn, N. Y. Presented at the Elastomers and Plastomers Section, XII International Congress, Sept. 11, 1951.

Chlorinated resins are very useful materials in many protective coating applications. The resins under discussion include chlorinated rubber and chlorinated paraffins. Properly formulated chlororesin films (chlorinated rubber and chlorinated paraffins) are resistant to outdoor weathering, accelerated baking temperatures, and the action of certain acids, alkalies, and salt solutions.

For reasons of economy, availability, and film forming properties, chlorinated paraffins are desirable additives to chlorinated rubber and other synthetic rubber finishes. However, under conditions of practical use, both chlorinated resins rapidly degrade and discolor the films. The result is that they may be unsuited for many uses and their desirable film forming properties are lost. The most active degraders are heat and light. Certain metallic oxides also exert a degrading action on chlororesins. The mechanism of degradation and some of the products formed are discussed.

Data are presented showing the effect of various stabilizers such as compounds of cadmium, tin, and lead. These effects are treated individually as heat alone and combined heat and light. The proper selection of effective stabilizers against heat and light overcome these effects and result in a product suitable for more widespread application.

Evaluation of Plasticizers For Vinyl Resins

Patton, T. C., Baker Castor Oil Co., Bayonne, N. J. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

Evaluation of plasticizer performance in vinyl resins is discussed from the standpoint of the inherent properties of the plasticizer itself, and the contribution of the plasticizer to permanent film flexibility. Because a plasticizer does not lose its chemical identity in a plasticized vinyl resin, it confers to the system its own properties of color, odor, toxicity, flammability, volatility, solubility, and chemical reactivity. Except for flexibility, a negative contribution is ideal. Flexibility, in turn, can be evaluated directly (stretching, bending, twisting); indirectly (tearing, cracking, shrinking); or change in flexibility can be inferred from measurement of plasticizer loss (volatility, exudation, leaching, migration).

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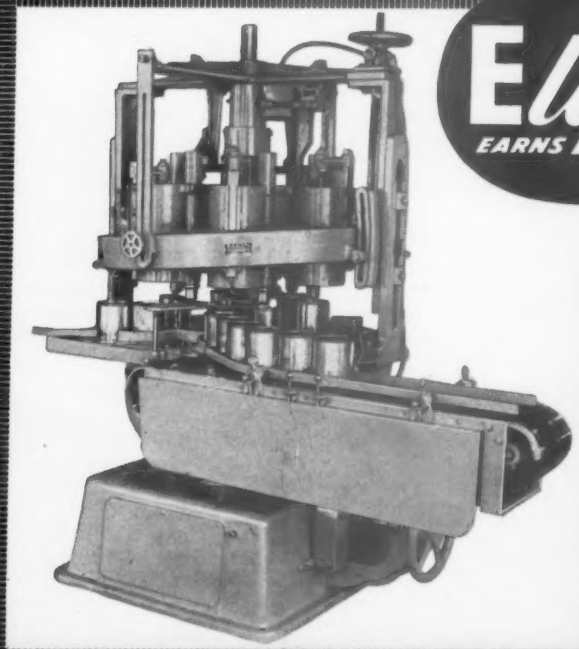

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PULSATION IN—

(*From page 24*)

sti ıtes surging.

he frequency and intensity of su ing depends upon: (1) the slo e of the pressure-vs-volume cu ve, (2) the rate at which air is be g removed from the system, an (3) the volume of the pipe system to which the blower is delivering air. The same principles apply whether the centrifugal unit is operating as a blower or an exhauster.

The wisest action to take in the prevention of pulsation is the anticipation of circumstances which might cause it. The phenomenon will not occur in volumes above the point E. If the application is such that low turn-downs are expected, it is prudent to so indicate when the blower is being ordered. The blower manufacturer, can in most cases, select and specify to prevent pulsation.

If, however, pulsation or surging is noticed in a finished installation, any of the following four steps can be taken:

(1) Consider the economics of replacing the blower with a smaller capacity unit having a consequently lower surge point.

(2) Consider purchasing a small capacity unit for turn-down periods.

(3) Make sure that the amount of air delivered by the blower is always above the surge point by bleeding enough air out of the system beyond the blower. If you are handling gas rather than air it will be necessary to recirculate this bleed flow back into the blower inlet. If you recirculate the bleed, however, remember that you are compressing and re-compressing that portion of the gas and building up the blower temperature to a point which may be detrimental.

4) If the surging is infrequent and of short duration, it may not be harmful to the blower at all. Surging at the point of air or gas use may be eliminated by adding a surge tank or increasing the cubical content of the piping in front of the nozzle.

(5) Ask the manufacturer to make minor changes in the blower design to permit by-passing of the air, or take other steps which will eliminate the troublesome pulsation at the sacrifice of a little blower efficiency or tightness of the installation.

Actually, the more efficient a blower operates and the tighter the air system is beyond the blower, the more likely it is to surge at very low operating points. Fortunately, the uses for compressed air or gas, which demand blower operation at critically low output, are infrequent so that the use of high-efficiency equipment can be used in all but the rarest of cases.

•

Sears Roebuck Building New Plant in Texas

De Soto Paint Company, subsidiary of Sears, Roebuck & Co., Chicago, recently began construction of a million dollar factory in industrial West Garland, Texas, in the northeast Dallas area.

At the start of operations about 100 workers will be employed and this is expected to rise to 350 at peak operating level.

CSC increases METHANOL output

Commercial Solvents Corporation, a leader in the field of petrochemicals, has stepped up production of synthetic methanol at its Sterlington Plant in Louisiana to an all-time high.

Output will be still further increased upon completion of additional units now under construction at Sterlington. Scheduled to be in operation by the spring of 1953, the new $20,000,000 facilities will double both methanol and ammonia output.

High-quality CSC methanol, produced from natural gas, is being supplied at a minimum purity of 99.85% in tanker, barge, tank car, tank truck and drums to all parts of the United States from conveniently located bulk and distribution points. For further information contact the Industrial Chemicals Division, Commercial Solvents Corporation, 260 Madison Ave. New York 16, N.Y.

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SYNTHETIC RUBBER

(*From page 28*)

Preparation

BECAUSE water is the continuous phase of the paint, the use of steel or copper equipment has to be avoided when the paint is expected to remain in it during long periods. The main problem in making such paints is to prepare a stable emulsion in which the pigments are very finely dispersed. Since most pigments are wetted more easily by water than by oils and the use of wetting agents is always possible, grinding of the pigments is not usually necessary. A good agitator is all that is required, but when oils also have to be incorporated into the paints this agitator should be a high-speed one. The following sequence of operations is recommended.

a. Wetting of pigments by water or by a solution of casein, starch or the like, which may contain emulsified drying oils.

b. Addition of thickening agents dissolved in water.

c. Addition of preservatives and antifoaming agents.

d. Addition of plasticizers for the latex (if required).

e. Addition of latex.

f. Final adjustment of viscosity by adding more water or more solution of thickening agent.

The whole process can be done in a stainless steel tank with agitator, and after each step agitation is continued for some time; pigment dispersion requires about 30 minutes. A wooden tank can also be used.

After preparation the paint is stored for a few days to reach equilibrium between plasticizers, oils, and latex, and also to remove air bubbles.

The latex paints are packed in varnish-coated steel cans or in heavily tinned cans.

The pigment-volume content of practically all wall paints of this type is between 30 and 40 percent. The water content is between 40 and 50 percent by weight. A gallon of white wall paint normally contains 3-4 lb. of pigment and 2-4 lb. of latex. Sealers contain more latex. It is hardly possible to quote a complete formula for a latex paint that would be representative because the variation is so enormous. Moreover, a manufacturer thinking of making a paint of this type may prefer certain raw materials that are most readily available to him. Latex paints may be varied very widely according to the raw materials put in, and also according to special requirements. Some may want a paint for concrete, others for gypsum. Some may put most emphasis on washability, others on grease resistance, or slight gloss, or very good levelling. Thus each manufacturer must decide what would be the best paint for his purpose.

The weight per gallon is 10-11 lb., and the raw material cost at present is $1.20-$1.50 per gallon.

Application

THE paints are applied by all conventional means, by brush, spray-gun, or roller; dipping is also possible. They brush easily without dragging and they do not sag on vertical surfaces. They have fair levelling, so that brush and spray marks largely disappear. The rapid drying, sometimes taking only a few minutes, requires some care with the tools after the job is done or when it is interrupted. Brushes must be kept in water or washed at once with water. If the paint dries on the tools, only a strong solvent such as amyl acetate or high-flash solvent naphtha will remove the paint residues; a little soap may be helpful also.

The principal application is on walls, concrete as well as gypsum plaster. If the wall is very porous it is recommended that it be sealed by means of a straight latex primer. The rapid drying will enable recoating to be done in a very short time, without any trouble in making joints. Resistance to rubbing develops after some time — usually one day — and needs a longer time when the paint contains oil or alkyd resin in addition to the latex. Drying may be done at elevated temperatures.

Because the paint films, unlike most other wall paints, have adequate flexibility, application on wood is possible if it is first primed to prevent the raising of the grain. Latex paints may also be applied over oil coatings. By decreasing the pigment content a more glossy coating can be obtained. This is done by adding latex to the flat paint.

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W. A. Henson: "Latex Paint Progress", *Official Digest*, 1951, No. 316, p. 298.

R. A. Brenneck: "Bakelite-Polystyrene Emulsions for Industrial Coating Applications", *Official Digest*, 1951, No. 317, p. 352. *Rubber*, 1951, 7, p. 132.

Products Mentioned

1. Plasticizer H B 40, Monsanto Chemical Co.
2. Santicizer 160, Monsanto Chemical Co.
3. Hercules Powder Co.
4. Atlas Powder Co.
5. Monsanto Chemical Co.
6. El Dorado Works.
7. Balab.
8. Socony Vacuum Oil Co.
9. Dowicide B, Dow Chemical Co. or Santobrite, Monsanto Chemical Co.
10. Dowicide G, Dow Chemical Co.

•

AMSCO Opens Mid-South Office

The establishment of an American Mineral Spirits Company office in Jackson, Mississippi was announced by Edward M. Toby, Jr., President. Amsco's new offices are located in the Plaza Building, Congress and Amite Street, Jackson, Mississippi. The opening of the office in Jackson marks the creation by Amsco of a Mid-South Territory to better serve accounts in that area in the rapidly growing field of extraction, particularly cottonseed oil, Mr. Toby said.

Thomas Barker has been promoted to the position of Manager of Amsco's new Mid-South Territory, having been moved from the company's southeast headquarters at Atlanta. He will be responsible for the marketing of Amsco's complete line of technical naphthas and petroleum base solvents to industry.

•

Dewy and Almy Adds Two Engineers

Two engineers have been added to the staff at the Acton, Mass., plant of Dewey and Almy Chemical Company — one in the polymer division, and one in the plasticizer plant.

Harold W. Flood has been assigned to the new plasticizer plant where he will assist in getting production under-way. O. Benjamin Hander has been assigned to the polymer plant where he will handle special production problems.

TECHNICAL Bulletins

MIXING EQUIPMENT

MIXER CATALOG

Catalog describes turbine-type Lightnin Mixers for open and closed tanks, and contains a factual discussion of fluid agitation.

In 32 illustrated pages, the new Lightnin Mixer catalog explains how guaranteed fluid agitation results may be obtained for any process. It shows how to anticipate process changes by installing a mixer with interchangeable speeds. It describes how a standard-design mixer can be adapted to give the versatility of a custom-design unit.

The new catalog also describes how mixing impellers are scientifically selected and sized for specific jobs; and how research is used to develop accurate prediction of fluid agitation results.

Request Catalog B-102. Address requests to Mixing Equipment Co., Inc., 200 Mt. Read Boulevard, Rochester 11, N. Y.

BUTYL SOLVENTS IN LACQUER

Concurrent with the announcement of the commercial production of isobutyl acetate and isobutyl alcohol based on isobutyraldehyde from Texas Eastman Company, Tennessee Eastman Company has published a booklet comparing the properties of these isobutyl solvents with their normal butyl homologues with respect to their use in lacquer formulations.

The comparisons are based on such characteristics as the relative evaporation rates of the isobutyls versus normal butyl acetate and alcohol and dilution ratios of iso and normal butyl acetate with respect to toluene and V.M.&P. naphtha. A table showing the effect upon viscosity when isobutyl acetate is substituted for normal butyl acetate in solutions containing various resins and polymers is also given.

Conclusions drawn indicate that both isobutyl acetate and isobutyl alcohol are generally interchangeable with the normal butyl solvents in furniture and automobile finishes, hot spray lacquers and specification dopes without altering any of the desired surface characteristics. It is also suggested that these solvents can be used for preparing reducers, lacquer thinners and solvent blends. Copies of the booklet are available upon request to Tennessee Eastman Company, Kingsport, Tennessee.

MOTORS

Construction details of explosion-proof, fan-cooled, and non-ventilated motors are described in bulletin 51B7286A. Allis-Chalmers Manufacturing Co., 1151 S. 70th St., Milwaukee, Wis.

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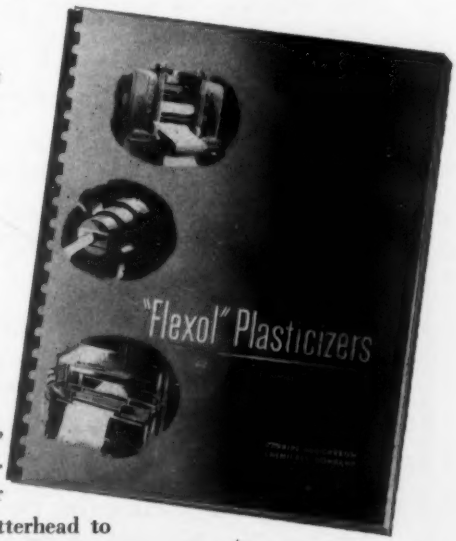

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DISPERSIONS

Alk-O-Mer high polymer resin dispersions for rubber base paints are covered in this technical service bulletin.

In addition to general information, this bulletin deals with five specific Alk-O-Mer dispersions, discusses preparation of Alk-O-Mer resin dispersion paints, properties and applications of these paints, and also includes a raw material survey.

Copies of this bulletin may be obtained by writing to Mr. George Murphy, Sales Manager, Alkydol Laboratories, Inc., 3242 South 50th Avenue, Cicero 50, Illinois.

PLASTICIZER

Seven-page bulletin covers phthalate plasticizers; dibutyl phthalate, diisoctyl phthalate, di-2-ethylhexyl phthalate, butyl cyclohexyl phthalate, and dicyclohexyl phthalate. Physical and chemical properties, and compatibility with synthetic resin are also discussed. The Barrett Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y.

SAFFLOWER OIL

Safflower growing and industrial uses of safflower oil are featured in a bulletin released by the Pacific Vegetable Oil Corp., 62 Townsend St., San Francisco, Calif.

CARBITOL

Technical bulletin on butyl "Carbitol" covers the physical and chemical properties, shipping data, and industrial uses. Bulletin F-7906 is available from Carbide & Carbon Chemicals Co., 30 E. 42nd St., New York 17, N.Y.

1952 SOYBEAN BOOKLET

Latest authoritative information concerning the soybean crop and industry is presented in the 1952 edition of the "Soybean Blue Book".

Assembled for quick reference are tables on production of soybeans by states and years, with prices and utilization of soybean meal and oil. Directories of soybean processors, oil refiners, and manufacturers using soy products are included. Book is available at one dollar per copy from the American Soybean Association, Hudson, Iowa.

EPON CURING AGENT

Four page booklet covers various aspects of curing agent for Epon-urea formaldehyde formulations. Such important factors as curing conditions, stability and properties of films in which curing agent was used, formulations, and uses for such coatings are discussed. Shell Chemical Corp., 500 Fifth Ave., New York 18, N. Y.

ORGANIC CHEMICALS

Bulletin describes line of organic chemicals such organic solvents; industrial chemicals such as allyl chloride, allyl alcohol, and dodecyl benzene; and resins and plastics together with specifications.

ACS PAINT DIV. BOOKLET

A limited number of preprint booklets containing the complete papers presented before the Division of Paint, Plastics and Printing Ink Chemistry at the Milwaukee meeting of the American Chemical Society are available at $2.00 each from the Secretary of the Division: H. F. Payne, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y. Please send check payable to the Division with your request for booklets to the Secretary.

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SILICONES

Thirty-two page booklet entitled "What's a Silicone" answers its lead query by investigating the action of silicones in polishes, water repellents, fluids, release agents, lubricants, defoamers, protective coatings and electrical insulation. Dow Corning Corp., Midland, Mich.

DUST COLLECTOR

Pangborn Corporation, Hagerstown, Md., offers an eight-page, two-color bulletin on its new cloth-bag dust collector for carbon black, cork, fine wood, graphite, pigments, lime, soap, metal oxides and similar dusts.

Illustrated by 12 photos, seven line drawings, and two elevation drawings, the bulletin tells how the cloth-bag collectors work, and how they are installed and maintained. It also gives specifications of standard collector sizes and dimensions.

It describes how the collector, designed to contain a minimum number of simple parts, can be inspected and maintained from a walkway between the bags without using tools. With text and illustrations, it shows how the bags, wing-nut fastened to the combined suspension and shaking members, are sealed to the floor with hand knobs.

MONOMERS

Booklet lists over 250 monomers such as vinyl, allyl, and diallyl esters of straight chain acids, alkyl acrylates and methacrylates, etc. for production and research. Monomer-Polymer Inc., Leominster, solids content, pH, particle size,

CLASSIFIED ADVERTISEMENTS

Rates: $.20 per word, except those seeking employment, for which rate is $.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.

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Technical Service Data Sheet
Subject: PROTECTING FRICTION SURFACES WITH THERMOIL GRANODINE®

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Thermoil-Granodizing greatly prolongs the life of parts subject to friction. It protects the surface of products like the diesel engine liners shown above and the many moving parts of automobiles and other machines. "Thermoil-Granodine" with its remarkable lubricating properties is particularly valuable in these and similar applications because of its ability to retain oil and maintain lubrication under high pressures and high velocities. This ACP wear-proofing chemical not only permits rapid break-in without scoring, scuffing and welding but also reduces subsequent wear on friction parts.

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"THERMOIL-GRANODINE" MEETS THESE SPECIFICATIONS

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MIL-C-16232 Type I	Coatings — phosphate; oiled, slushed, or waxed (for ferrous metal surfaces) and phosphate treating compounds.
AN-F-20 (See also U.S.A. 3-213)	Finishes, for electronic equipment.
U.S.A. 57-0-2C Type II, Class A	Finishes, protective, for iron and steel parts.
U.S.A. 51-70-1 Finish 22.02, Class A	Painting and finishing of fire control instruments; general specification for
M-364	Navy aeronautical process specification for compound phosphate rust-proofing process.

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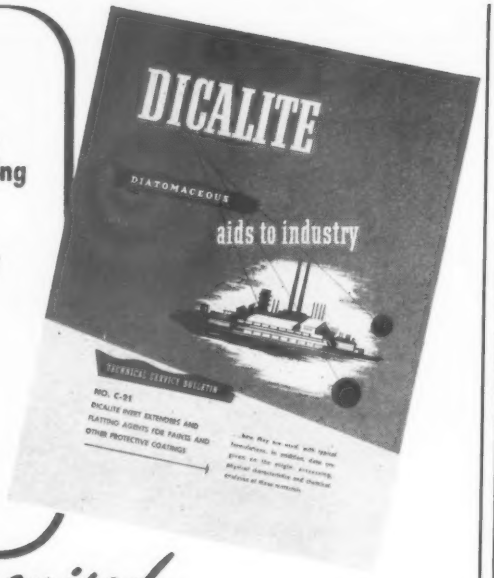

covered in the *revised*

DICALITE* Technical Service Bulletin C-21

on inert extenders and flatting agents

This revised Bulletin C-21 summarizes results of 5-year exposure tests of outside house paints using Dicalite inert extenders. Complete physical and chemical data are listed on all Dicalite materials. Typical formulations are given for inside and outside house paints, flat varnishes, traffic paints, etc. The bulletin explains how Dicalite increases the hiding power of prime pigments—produces given hiding power with less prime pigment and without harm to color—also strengthens the film, improves brushing, leveling and washability.

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